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A CASE OF ARTERIAL DISEASE, POSSIBLY PERIARTERITIS NODOSA.[1]

By Florence R. Sabin, M. D.

Mrs. R. G., æt. 32, was admitted to the Johns Hopkins Hospital on October 21, 1900, in the service of Dr. Osler, to whom I am indebted for the opportunity of reporting the case. She died October 26, 1900. She complained of weakness and stomach trouble. The family history was unimportant. She had been married eleven years, had had three children and no miscarriages. She had had measles and possibly malaria. She was a well, strong woman up to four years previous, when she had an attack of dropsy. For this she was treated at the St. Luke's Hospital, New York City, where the diagnosis of chronic nephritis and endocarditis was made. Since that illness she had never felt well, had had shortness of breath and amenorrhœa. There was no history of syphilis. She had never taken alcohol.

The present illness began in August, 1900, two and a half months before admission. During the summer she had loss of appetite, indigestion, vomiting and weakness. In August she had attacks of severe shooting pains in the arms and legs. She said that the veins in her arms and legs were swollen and painful to the touch. At the same time she had pain in the epigastric region. On the 19th of September she went to bed with an attack of vomiting which continued four or five days. From that time on, 5 weeks, she had been almost confined to bed. She had had occasional attacks of vomiting, the vomitus being green and containing undigested food but no blood. The bowels had been constipated, the stools light yellow. At the time of admission, she was having diarrhœa with 2 to 4 stools a day. Two weeks before admission her flesh became tender to the touch, and she was unable to move in bed on account of pain. She had lost weight and strength rapidly. Once during the attack she had a rash like measles over the trunk. It lasted four or five days.

[1] Read before the Johns Hopkins Hospital Medical Society, December 17, 1900.

She had had frequency of micturition and occasional swelling of the feet. The urine had been scanty in amount.

On admission she looked extremely ill. There were emaciation, anæmia and asthenia. The skin was sallow, the lips and mucous membranes bloodless, the sclerotics blue. There was a brownish pigmentation of the face, hands and arms. The small muscles of the hands were atrophied. The lungs were negative, the heart not enlarged and its sounds were normal, save for a soft systolic murmur heard best in the pulmonic area. The arteries showed an extreme grade of annular sclerosis. Both radials were calcified so that no pulsation could be felt at the wrist. The pulse was taken at the elbows. The brachials were beaded and could be felt as a series of annular rings. The mammary artery was calcified. The right one could be seen as a string of beads crossing three or four ribs. (Dr. Osler.)

In each popliteal space there was a row of small, hard nodules about the size of a split pea. Two were excised and proved to be made up of lime salts. They were directly under the skin, where the vessels were too small to make out any relations. Scattered over the abdomen were similar nodules; they felt softer and seemed more in the muscle than in the skin. Just above the umbilicus and over both tubera ischii were areas of firm induration in the skin measuring about 4 by 5 cm. Those over the ischia were nodular. She described them as warts.

The abdomen was sunken, the walls so thin that the coils of intestine were plainly seen. There was extreme tenderness in the epigastrium. The liver dulness extended from the 5th rib to a point 3.5 cm. below the costal margin in the mammillary line, and 9.25 cm. below the tip of the ensiform in the median line. The edge of the spleen was palpable 1 cm. below the costal margin. The stomach measured 22.5 by 11 cm. after inflation; it was displaced so that its lower border was 7.5 cm. below the umbilicus. No masses could be made out. Vaginal examination was negative, except that there was one small nodule on the vulva. There were no scars. The cervix and uterus were small and there were no masses in the pelvis. There was a slight purulent discharge in which no gonococci could be found. There was no glandular enlargement. The patellar reflexes were exaggerated.

The blood examination was as follows: On October 22 the fresh specimen showed considerable variation in the size and shape of the red cells, the average diameter being less than normal. The red corpuscles were extremely pale. There was much fibrin and the blood platelets were extraordinarily increased. (Dr. Thomas B. Futcher.) October 22, hæmoglobin, 22 per cent; red blood corpuscles, 1,772,000; white blood corpuscles, 50,000. The differential count of 312 leucocytes showed: polymorphonuclear leucocytes, 91 per cent; small mononuclear leucocytes, 2 per cent; large mononuclear leucocytes, .9 per cent; transitional leucocytes, 2 per cent; eosinophilic leucocytes, 2 per cent; two normoblasts. October 25, white blood corpuscles, 81,000. October 26, hæmoglobin, 21 per cent; red blood corpuscles, 1,704,000; white blood corpuscles, 116,000.

The fresh specimen was the same as before, the increase in leucocytes being due to the polymorphonuclear forms. The blood examination showed then a secondary anæmia and a pure leucocytosis.

The temperature was subnormal throughout, the range being 96° to 97.8°. This includes simply the last week of the illness. At the same time the pulse was rapid, ranging between 104 and 124. It fell to 90 on the day of her death. The urine was scanty in amount, 180 cc. being the highest record for the 24 hours. She had, however, from 2 to 4 stools a day. The specific gravity of the urine was 1010; it was almost colorless and had a considerable trace of albumen and a few finely granular and epithelial casts. On October 25 there was almost no urea in a 24-hour mixed specimen. There were but four or five small bubbles of gas generated in the sodium hypobromate solution. Notwithstanding this low excretion of urea the mind was clear; she was drowsy but awakened as soon as any one stepped to her bed, and she was not in coma until four hours before death.

During her stay in the hospital her chief complaint was of pain and burning in the stomach. This was worse on swallowing when she said that she felt a burning like fire all the way down. She had great thirst but little appetite. At times the muscles of the arms and legs were tender to pressure and again the skin over the hips became so sensitive that she would cry out at the slightest touch. Pressure over the epigastrium always made her cry out with pain. Her sleep was disturbed, occasionally waking in fright. On the day of her death there were subcutaneous hæmorrhages on the legs, and the feet and hands became cyanosed and cold. It is a matter of great regret that no section could be obtained. Her people were strict Jews and took her home as she was dying, evidently in dread of an autopsy. When she left the hospital at 5 P. M. her mind was perfectly clear; she was conscious when she reached home but soon fell asleep and died in four hours without waking.

At first the case was considered to be Bright's disease with secondary anæmia but the presence of the nodules suggested the necessity of further study, and it was found that the clinical features of the disease corresponded with the case of periarteritis nodosa, described by Kussmaul and Maier in 1866. A good account of this case was found in Allbutt's System of Medicine.

Four cases of periarteritis nodosa have been described. In all of the lists in the literature, a fifth case of multiple aneurisms due to syphilis and reported by Chvostek and Weichselbaum in 1877, is included.

Case I.[2] In 1866 Kussmaul and Maier described a hitherto unknown arterial disease, which they called periarteritis nodosa, associated with Bright's disease and progressive muscular atrophy. The case was a young tailor, aged 27. His illness lasted a little over a month. He complained of staggering, chilly feelings with fever, and of having his hands go to sleep. They describe him on admission as so sick that

[2] Kussmaul A. and Maier, R. Deut. Arch. f. klin. Med., 1866, Bd. i, S. 484–518.

the prognosis was made before the diagnosis, that on first sight he was known to be a lost man whose days were few and numbered. This was true of our case. Their case was observed for one month, the entire duration was seven weeks. The symptoms were as follows: pains in the muscles both spontaneous and on pressure, areas of hyperæsthesia of the skin, great weakness which developed rapidly, loss of appetite, pain in the abdomen, especially in the hypochondriac region, and pain in the groins. There was great thirst, at first constipation, later diarrhœa. Sleep was disturbed but the mind was clear throughout. A progressive paralysis developed, beginning with the small muscles of the hands and gradually including the entire body.

The signs were of extreme anæmia, a "chlorotic marasmus." The temperature range was 97.5°-102.5° F.; it was never high and much of the time there was no fever In contrast with the low temperature, the pulse was rapid, 112-132. Heart and lungs were normal, liver and spleen not enlarged. There was muscular atrophy beginning with the small muscles of the hands. The urine was diminished in amount, of low specific gravity, 1011-1019, and contained albumen and casts, at first blood also. Three days before death small subcutaneous nodules were felt over the breast and abdomen. These had developed during the course of the disease.

A section was obtained in which the interest centred on these nodules. They were found on the small and medium sized arteries of the muscles and viscera; the heart and lungs, liver, spleen, alimentary canal, kidneys and especially the mesentery showed them, while the arteries of the brain, the aorta and its branches were exempt.

Case II.[3] In 1878, Meyer described a case much like Kussmaul and Maier's. It was a man, æt. 27. He was sick 8 weeks, and was under observation must of this time. He complained of pains in the neck, calves of the legs and groins. There was a history of gonorrhœa and syphilis. He showed extraordinary prostration. There were attacks of pain in the stomach and pressure over it was unendurable. The bowels were constipated. There were muscular pains but no paralysis and no disturbance of sensation. The mind was clear but toward the end he became irritable and restless.

The signs were extreme anæmia, a "chlorotic marasmus." The pulse range was 92-108, the temperature reached 104° in the early part of the disease, later the daily range was from 98.8° to 101.8°, and finally it was continuously normal. The heart and lungs were normal, the liver and spleen became enlarged while under observation. The urine was decreased in amount and showed albumen. There was transient œdema of the feet and legs. The nodules were not found before death. On section nodules were found with the same distribution as in Case I. Meyer regarded the nodules as aneurisms.

Case III.[4] Fletcher's case was a woman, æt. 49. The duration was about 2 months, and she was under observation at the Freiburg Clinic for the last 3 weeks. There was no history of syphilis; her husband had died of tuberculosis. She was fairly well nourished, and there was a peculiar staring expresssion of the face. In our case a retraction of the upper eyelids gave a staring expression. There was occasional vomiting and alternating constipation and diarrhœa. She had cough and expectoration. The physical signs of the heart were normal save a modification of the first sound at the apex. There were a few râles at the apices of both lungs. The liver was small, the spleen large. The temperature range was 98.6° to 104°, the pulse 96-138. The urine had a trace of albumen and there was œdema of the feet and legs. No note is made of anæmia nor of a blood examination. The case was thought of before death as either typhoid fever or miliary tuberculosis.

Section showed no tuberculosis. Nodules were found in all the viscera except the brain. The liver and spleen were both enlarged. The autopsy was made by von Kahlden.

In 1894 von Kahlden[5] saw a second case. It was a woman, æt. 52. The duration 12 weeks, but she was under observation only one day. She complained of fever, loss of appetite and pain in the right hypochondrium. She had had sweating, pain in the arms and legs and great weakness. While under observation she complained of the pain in the stomach as a terrible burning. There was constipation. Sleep was disturbed but the mind was clear. The signs were as follows: the temperature was 99.8°, normal at the end; the pulse was 140. The anæmia was extreme, the skin being light yellow. She had had transient œdema of the face. The physical examination is not given but the section showed no enlargement nor valvular lesion of the heart. The lungs were firm but not airless. The spleen was not enlarged. Nodules were found in the muscles of the chest and tongue and in all the viscera except the brain. They were most numerous in the mesentery.

These four cases were all proved by autopsy; and clinically the case herein reported presents the same features. The lesions of the disease are nodules on the arteries of the muscles and viscera. The symptoms are associated with the muscles, the circulatory system and the alimentary canal. The muscles give pain, occasionally paralysis and atrophy; the circulatory system anæmia accompanied by an asthenia, similar to that in Addison's disease. The pulse rate is rapid, the temperature relatively low. There is fever at first, later normal or subnormal temperature. The chief symptom is gastrointestinal; namely, pain in the stomach accompanied by loss of appetite, thirst, vomiting, constipation and diarrhœa. The signs of Bright's disease are present in the urine but œdema is slight and transient and the mind is clear throughout.

The cases have a wider interest than is due their rarity on account of their pathology. Meyer and Eppinger consider the nodules as aneurisms of the small and medium sized

[3] Meyer, P. Arch. f. path. Anat. u. Phys. u. f. klin. Med., 1878, Bd. lxxiv, S. 277-319.

[4] Fletcher, H. M. Beitr. z. path. Anat. u. z. allg. Path., Jena, 1891, xi, 323-343.

[5] von Kahlden, C. Beitr. z. path. Anat. u. z. allg. Path., Jena, 1894, xv, 581-601.

arteries. These aneurisms are considered by some to be of syphilitic origin. On the other hand, Chvostek, Weichselbaum, Fletcher and v. Kahlden think that the nodules are inflammatory, or allied to the infectious granulomata and that the aneurisms are secondary to this process. It is a matter of great regret that we could not secure an autopsy in our case; the blood counts showing a pure leucocytosis of a high grade point, it seems to me, toward the inflammatory nature of the disease.

Discussion.

Dr. Welch.—It is interesting that Dr. Osler and Dr. Sabin are willing to make this diagnosis without an autopsy, that is, that they consider the clinical picture sufficiently distinctive, with these nodules, to justify the diagnosis. I judge from the summary of the histories of other cases that there has been considerable uniformity in their characters. The number seems, however, too small for more than tentative conclusions.

TYPHOID INFECTION WITHOUT LESION OF THE INTESTINE. A CASE OF HÆMORRHAGIC TYPHOID FEVER WITH ATYPICAL INTESTINAL LESIONS.[1]

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and

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The intestinal lesions of typhoid fever vary greatly in extent and distribution. Swelling, necrosis and ulceration of the Peyer's patches are usually present throughout a considerable proportion of the lower ileum, but at times a single small ulcer may be the only macroscopic evidence of the intestinal disease. Occasionally the small intestine appears to be entirely unaffected, and hyperplasia and necrosis are confined to the lymphatic apparatus of the large intestine. Doubtless many mild cases run their course without any ulceration of the swollen patches. In a number of cases no intestinal lesions have been found at autopsy, though the clinical history has corresponded to that of typhoid fever and after death the typhoid bacillus has been demonstrated in the organs. To explain such cases one may assume that the organism can enter the body through the intestine without producing any lesion, or that the intestinal tract is not the only path by which it can enter.

The following case, which has directed our attention to this subject, resembles very closely those which have been described as instances of typhoid fever without intestinal lesion:

A. L., female, aged ten years, was admitted to the Johns Hopkins Hospital in the service of Dr. Osler July 14, complaining of pain in the abdomen and weakness. Her family history is unimportant. During the preceding spring she had had measles and has since been slightly deaf but otherwise has had good health. Her present illness began on July 9 with malaise, headache and backache. The bowels moved five or six times and she complained of some pain in the abdomen. On the following day she felt feverish and the diarrhœa and abdominal pain continued. Headache persisted but the diarrhœa became less severe and the pain disappeared. She vomited occasionally. There was no bleeding from the nose.

On admission the child, who was well nourished, appeared drowsy and uncomfortable and complained of some pain in the abdomen. Her mind was clear. The pulse was of small volume, easily compressible and not dicrotic, one hundred to the minute. Examination of the heart and lungs disclosed no abnormality. There was no abdominal distention. A few typical rose-spots were seen upon the abdomen and lower thorax. The spleen was felt at the costal margin when the patient lay on her side and its edge was firm. The temperature on admission was 102.4°. The Widal reaction was obtained on the following day the blood serum diluted 1 to 50, causing agglutination of the typhoid bacillus.

During the first three days after admission the patient complained of much abdominal pain. There was some distention of the abdomen and some tenderness which was most marked in the epigastric region. Beginning on the 6th day in the hospital and persisting a few days pain and tenderness were present in the right hypochondriac region and resistance was here felt. During the first week fresh rose-spots continued to appear. The abdominal pain and tenderness disappeared.

Beginning on the 13th day after her admission to the hospital, bleeding occurred from the lips and nose; at first it seemed as the results of irritation of these parts by continual picking with the fingers. Crusts formed from which blood oozed at times. Over the left cheek below the eye appeared a number of small purpuric areas and ecchymosis occurred into the skin about an excoriation over the right internal condyle of the humerus. The blood, tested by Wright's coagulation tubes, was found to coagulate in four minutes and forty-five seconds. Bleeding from the nose in small amounts

[1] Read before the Johns Hopkins Hospital Medical Society, January 7, 1901.

was persistent. During the night of the 17th day after admission, 60 cc. of bright red blood were passed from the rectum and the following day two soft stools consisted almost entirely of changed blood. The red corpuscles numbered 2,256,000, white corpuscles 3250; the hæmoglobin was 41 per cent.

The note made on the 19th day of observation states that the child seems very ill. The bleeding from the nose has temporarily stopped. The mucous membranes are anæmic. Numerous purpuric areas are scattered over the face, over the posterior surface of the right arm and in small number over the front and back of the trunk.

The stools for four days following the first passage of blood from the rectum contained changed blood in small amounts and there was some abdominal pain but no tenderness nor distention. On the 21st day bleeding from the nose again occurred. The blood examination was as follows: red blood corpuscles 1,768,000, white corpuscles 15,000, hæmoglobin 26 per cent, coagulation time five and a half minutes. There was repeated vomiting of swallowed blood. New purpuric spots had appeared upon the cheeks and shoulders. The patient died with gradually increasing weakness on the 21st day after admission to the hospital, the 26th day of her illness.

During the first few days in the hospital the temperature was almost continuously between 102° and 104°, while subsequently it varied between 99° and 104.5°. The urine contained a trace of albumin and an occasional granular cast.

Autopsy.—The body is that of a well nourished child 128 cm. in length. Over the face are scattered purple ecchymotic spots, the largest 1.5 cm. across. Similar purpuric areas are sparsely distributed upon the trunk, upon the inner surfaces of the arms and upon the legs.

The peritoneum, pleuræ and pericardium are normal in appearance.

The heart weighs 120 grm. Below the epicardium of both ventricles are numerous ecchymoses about 0.5 cm. across. The muscle is pale brown in color and into its substance are a few small hæmorrhages. Below the endocardium of both ventricles but most numerous on the right side are small ecchymotic spots. The valves are normal. The lungs have a grayish-pink surface upon which are scattered areas of deep red color. The tissue is nowhere consolidated.

The liver weighs 820 grm. The tissue has a brownish-red color; the lobulation is well marked. The gall-bladder contains yellow bile. The spleen weighs 180 grm. and measures 11.5 x 7.2 x 4.2 cm. The capsule is smooth. The organ is soft in consistency. The pulp is of a very deep brownish-red color and the Malpighian bodies are well seen.

The stomach contains a small quantity of dark brown fluid material. Its mucosa is thickly studded with small bright red ecchymoses. The duodenum contains a small amount of bright yellow fluid. The jejunum contains brownish, partially clotted and slightly changed blood, and in the ileum, particularly in its lower part, is reddish-brown fluid in which are clotted particles. Passing downward Peyer's patches are first seen in the lower part of the jejunum and throughout the ileum they are numerous. Their surface is raised but little above the general level and is very slightly nodular; they are conspicuous only because they have remained unchanged while the surrounding mucosa is stained a brownish color by the intestinal contents. Above the ileocæcal valve is a very large Peyer's patch 15 cm. in length but otherwise presenting the appearance seen elsewhere. Solitary follicles are visible as small, slightly elevated nodules. The appendix vermiformis is normal. The solitary follicles of the large intestine which are readily seen are often marked by a minute central point of pigmentation.

Lymphatic glands in the mesentery, above the pancreas, and on either side of the aorta, are enlarged, often 1.5 cm. in length, soft and succulent. Some of the larger show on section a central dull red area surrounded by a zone of yellowish-gray color. The ileo-colic glands are enlarged.

The kidneys together weigh 200 grm. The capsule tears away readily and leaves a smooth pale surface thickly studded with bright red ecchymotic points. Throughout the cortex are minute hæmorrhages. Several small ecchymoses are seen below the mucosa of the bladder. The bone marrow of the femur is of deep red color. The other organs are normal.

Microscopical Examination.—The liver contains scattered foci of necrosis within which are proliferated cells with round or irregular nuclei. The sinuses of the mesenteric and retroperitoneal lymphatic glands are distended with large cells of an epithelioid type, many of which contain ingested lymphocytes. In places these cells are necrotic and their nuclei no longer stain. Sections through several Peyer's patches of the lower ileum show no hyperplasia nor is there any infiltration of the muscularis with lymphoid cells. In some sections are found collections of a few large cells of an epithelioid type. The solitary follicles of the large intestine appear to be normal.

Bacteriological Examination.—Agar-agar plate cultures were made from the heart's blood, lung, liver, gall-bladder, spleen and kidney. The bacillus coli communis was obtained from the liver and kidney. From the liver, gall-bladder and kidney was obtained a motile bacillus of similar morphology and cultural characters but with the following peculiarities:

On potato a moist glistening appearance is noticeable at the end of twenty-four hours; at the end of two days the growth is visible as a thin yellowish-white film. Control cultures of the typhoid bacillus from other sources showed a similar growth upon potato of the same stock. Milk tinted with litmus is slightly acidified and is not coagulated. In litmus whey (Petruschky's medium) at the end of seven days, the acid formed in 10 cc. of the medium is equivalent to 0.6 cc. of one-tenth normal sodium hydroxide solution. Grown in glucose agar-agar the organism forms no gas. Tested in fermentation tubes it formed no gas with glucose, lactose or saccharose; with glucose the reaction of the medium was acid at the end of forty-eight hours, while with lactose and saccharose an alkaline reaction was retained. Indol was

not formed in Dunham's solution at the end of a week. Tested with the blood serum of a typhoid patient giving the agglutination reaction with a typhoid bacillus from another source, a positive agglutination test was obtained; with serum diluted 1 to 200 the reaction began in 5 to 10 minutes and clumping and cessation of motility was complete in 30 to 60 minutes. The organism gave the same reaction when tested with the blood serum of a rabbit immunized to the typhoid bacillus; with serum diluted 1 to 200 clumping occurred in 15 to 30 minutes. The characteristics enumerated serve to identify the organism as the typhoid bacillus.

The case resembles those which have been reported as instances of typhoid infection without intestinal lesions. The clinical course was that of typhoid fever; during the first two weeks rose-spots were present, the spleen was enlarged and the temperature curve was that usually observed. A positive Widal reaction confirmed the diagnosis. The disease did not appear to be of a very severe type until the occurrence of repeated hæmorrhage, persistent epistaxis, purpuric ecchymoses, and hæmorrhage from the bowel, finally producing grave secondary anæmia. At autopsy the usual intestinal lesions of typhoid fever were not found; there was no ulceration of the mucosa and the Peyer's patches and solitary follicles were so slightly changed that the alterations present might readily have been overlooked had not typhoid infection been suspected. The solitary follicles of the large intestine were marked by minute points of pigmentation. The history gives evidence that the intestine was implicated early in the disease since during the first and second weeks there were diarrhœa, abdominal pain and tenderness, and some distention. The presence of blood in the stools during the last week, in association with hæmorrhage from the nose and into the subcutaneous, subserous and subcutaneous tissues, was not the result of ulceration since careful examination showed the mucosa to be everywhere intact. In part at least the changed blood in the stools may have been swallowed from the nose. Though the intestinal lesions of typhoid were almost entirely absent, the mesenteric lymphatic glands and the spleen were enlarged and the liver contained foci of necrosis. The bacteriological examination of the case is sufficiently complete to demonstrate that the child died with typhoid fever complicated by a condition resembling purpura hæmorrhagica; the case is one of hæmorrhagic typhoid fever.

The disease did not run its course without intestinal lesions. The early diarrhœa and abdominal pain, the enlargement of the mesenteric lymphatic glands, the slight swelling of the Peyer's patches and solitary follicles of the small intestine and the presence of minute points of pigmentation upon the solitary follicles of the large intestine indicate that the intestine was not wholly unaffected. These lesions were slight and at the time of death had almost completely subsided. Doubtless hyperplasia of the lymphatic apparatus of the intestinal wall was more marked during the first weeks of the disease.

The number of cases of so-called typhoid fever without intestinal lesion is not large. The earlier cases are collected by Chiari and Kraus,[2] who have recorded six instances of what they regard as pure typhoid septicæmia, invasion of the internal organs without demonstrable intestinal lesion. Flexner and Harris[3] reviewing the literature regard as doubtful the earlier cases, those of Banti,[4] Karlinski[5] and Guarnieri,[6] since the means of identifying the typhoid bacillus then available are inconclusive. Ophüls[7] has in the last year again reviewed this literature. In some of the reported cases he believes the organism entered the body by the usual path, while in others the published reports do not exclude the possibility that lesions were present but subsequently subsided. He thinks that the necessary means now at our disposal for the differential diagnosis between the typhoid bacillus and allied forms were employed only in the case of Flexner and Harris, in the three cases of Lartigau[8] and in the one reported by himself.

Cases reported as instances of typhoid fever without lesions of the intestine fall into several groups. (*a*) In many cases the typhoid bacillus has not been identified with certainty so that the nature of the disease is doubtful. (*b*) In some of the cases which are cited as examples of the condition slight lesions of the intestine are described. (*c*) Primary tuberculous ulceration of the intestine has, it appears in at least three cases, afforded a portal of entry for the typhoid bacillus, characteristic intestinal lesions of typhoid fever being absent. (*d*) Death may have occurred so long after the onset of the disease that opportunity has been given for the subsidence of preexisting lesions. (*e*) In a small number of cases death has occurred during the first four weeks of the disease and careful bacteriological examination has demonstrated the presence of the typhoid bacillus in the organs after death.

Though we cannot deny the possibility that typhoid fever may occur without lesions of the intestine, much of the evidence furnished by the published reports is inconclusive. In many reported instances the demonstration of the typhoid bacillus has been incomplete, insufficient means having been used to identify it. The cases of Banti and of Guarnieri, as stated by Flexner and Harris, belong to a period at which the difficulty of separating the typhoid bacillus from allied forms was not recognized.

Karlinski[9] has recorded three cases of typhoid fever without intestinal lesion, certainly a rare condition, all of which were under observation within a period of two months. The

[2] Zeitsch. f. Heilkunde, 1897, xviii, p. 471.

[3] Bulletin of the Johns Hopkins Hospital, 1897, viii, p. 259.

[4] Riforma medica, 1887; Ref. Baumgarten's Jahresbericht, 1888, iv, p. 148.

[5] Wiener med. Wochensch., 1891, xli, pp. 469, 511.

[6] Riv. gen. di clin. med.; Ref. Baumgarten's Jahresbericht, 1892, viii, p. 234.

[7] New York Med. Jour., 1900, lxxi, p. 728.

[8] Bulletin of the Johns Hopkins Hospital, 1899, x, p. 55, and New York Med. Jour., 1899, lxx, p. 158.

[9] Loc. cit.

first two cases which were admitted to the same ward within a few days died on the twenty-third and twenty-second day of their disease. The third patient, who was convalescent from a minor operation upon the finger, acted as an attendant upon the first two and subsequently contracted a similar disease. The clinical course in none of these patients resembled typhoid fever, and of the second in which a rash resembling rose-spots was present upon the trunk, neck and extremities, Karlinski states that had he not found the typhoid bacillus in the organs after death he would have regarded the case as one of typhus fever. In the three cases the spleen was very greatly enlarged but, except in the third, no intestinal lesions were found. In the lower ileum of the third patient, who died on the seventeenth day of his illness, four pigmented scars were present and these Karlinski thinks were the results of typhoid fever, but since the patient died during the third week it is improbable that they represented healed ulcers occurring during the fatal attack. From the spleen of all the cases and from other organs in the second and third Karlinski cultivated an organism which he believed to be the typhoid bacillus. The same organism he states was found repeatedly during life in blood from the third patient. As a means of identifying the typhoid bacillus Karlinski depended upon the character of the growth on potato, in the light of our present knowledge a very uncertain method. It seems probable that the three cases which Karlinski regarded as typhoid septicæmia were in reality, as he himself suggests, instances of typhus fever.

Beatty [10] describes the case of a man who suffered for six days with hæmaturia and jaundice. The intestine presented nothing abnormal. He mentions without details that the typhoid bacillus was found at autopsy and concludes that this case as well as a second resembling it but with no bacteriological examination, were instances of typhoid fever without intestinal lesions. In three of the six cases which Chiari and Kraus regard as instances of pure typhoid septicæmia the typhoid bacillus was not isolated from the organs, though a positive Widal reaction was obtained with the blood serum.

DuCazal [11] has recorded the case of a man who died with double pneumonia on the twenty-first day of his illness. The clinical course resembled that of typhoid fever; rose-spots were present and before death were extraordinarily confluent over the thorax and abdomen. The abdomen was greatly distended but there was no tenderness. At autopsy the spleen was much enlarged but there was no alteration of the intestine nor of the mesenteric lymphatic glands. From the spleen was obtained an organism having the cultural properties of the typhoid bacillus, but in the absence of the agglutination test its identity may be doubted. The patient of Pick [12] died on the twenty-fourth day of his illness; a positive agglutination reaction was obtained with the blood serum. No intestinal lesions were noted nor was the spleen enlarged, but the author states without giving details that the bacteriological examination demonstrated a typhoid infection.

The reports of several instances of so-called typhoid fever without implication of the intestine show that slight lesions were present. To this group belongs the case of Nicholls and Keenan.[13] The solitary follicles of the ileum were swollen, congested and of slaty color; the Peyer's patches were enlarged. The recently reported case of Ophüls [14] was not entirely without lesions of the intestine. The appendix vermiformis was the seat of well marked inflammation, and microscopic examination showed hyperæmia and enlargement of the lymphatic follicles; the epithelium was absent in places. Atypical cases of typhoid fever with only a single intestinal ulcer occur. Chiari and Kraus cite such a case reported by Banti.

Of considerable interest are several cases in which the typhoid bacillus was demonstrated in the organs, and though there were no characteristic intestinal lesions of typhoid fever the intestine was the seat of tuberculous ulceration. They seem to show that the typhoid bacillus can enter the body through pre-existing lesions of the intestinal canal. Guinon and Meunier [15] describe the case of a boy, eight years of age, who came under observation with symptoms of pulmonary tuberculosis. After several days rose-spots appeared, the temperature curve assumed the character present in typhoid fever and a positive Widal reaction was obtained. The autopsy disclosed generalized tuberculosis and tuberculous ulcers were found in the intestine. The typhoid bacillus was isolated from the spleen, from fluid in the pleura and from the lung. Lesions of typhoid fever were not found. Chiari and Kraus record two similar cases occurring in adults. Death occurred with chronic pulmonary tuberculosis, and tuberculous ulcers were present in the intestine but there were no lesions of typhoid fever. In the first case the typhoid bacillus was obtained from the gall-bladder and from the enlarged lymphatic glands, while in the second case the same organism was grown from the gall-bladder though cultures from the other organs remained sterile. In the latter case the blood serum during life diluted 1 to 10 agglutinated the typhoid bacillus, that from the femoral vein at autopsy diluted 1 to 20 produced the same effect. Such cases cannot be grouped with those in which the intestine appears to be healthy, since it is probable that the pre-existing intestinal lesion was the portal of entry for the organism.

In a certain proportion of the published cases the clinical history, the presence of the Widal reaction during life and the demonstration of the typhoid bacillus in the organs after death leave little doubt of the existence of typhoid infection though the intestine appeared to be normal. Doubtless many cases of typhoid fever run their course without intestinal ulceration, the primary hyperplasia of the lymphatic follicles subsiding without any loss of substance. Chiari and Kraus in

[10] Dublin Jour. of Med. Science, 1897, 3rd ser. cccii., p. 97.
[11] Bull et mém. de la Soc. méd. des Hop. de Paris, 1893, 3 s., x, p. 243.
[12] Wiener klin. Wochensch., 1897, x, p. 82.
[13] Montreal Med. Jour., 1898, xxvii, p. 9.
[14] Loc. cit.
[15] Le Bulletin médicale, 1897, xi, p. 313.

their article upon atypical typhoid and typhoid septicæmia record three cases in which death occurred with broncho-pneumonia during the third or fourth week; the lymphatic follicles of the intestinal wall were swollen but were not ulcerated. In several cases reported as instances of typhoid fever without lesion of the intestine death, occurring many weeks after the onset of the disease, was the result of some complication or sequela, and opportunity was given for the restitution of swollen lymphatic tissue. Since we are familiar with the persistence of the typhoid bacillus for long periods in the body, it is not surprising that the organism was demonstrated in the organs after death. To this group belongs the case of Kuhnau,[16] whose patient died with suppurative nephritis and cystitis on the fifty-eighth day of her illness after having undergone an attack of facial erysipelas. In one of the cases of Chiari and Kraus death took place on the forty-third day of the disease with multiple abscesses caused by the staphylococcus pyogenes aureus; the typhoid bacillus was found only in the urinary bladder. The third case which Lartigau[17] reports is that of a woman who, four months before her fatal illness, suffered with an acute febrile disease diagnosed typhoid fever. Death followed an operation for extrauterine pregnancy. The typhoid bacillus and the streptococcus pyogenes were isolated from the uterus. The case reported by Flexner and Harris[18] is that of a man who died two months after the onset of his fatal illness with thrombosis of the pulmonary artery to the lower lobe of the right lung, gangrene of the lung, perforation of the pleura and pyopneumothorax. The typhoid bacillus was grown from the lung, spleen, liver and kidney.

Cases in which death occurs early in the disease can alone afford conclusive evidence that lesions of the intestine have not been present. In the case which we have described death occurred on the twenty-sixth day of the disease, yet at autopsy very little evidence of intestinal lesion was found, though there was reason to believe that the intestine had been implicated. Cheadle and Lartigau have reported cases where death occurred during the third, fourth or fifth week.

Cheadle[19] reports the case of a boy three years of age. Little doubt can be entertained that he suffered with typhoid fever. A brother and a sister of the patient were coincidently affected with the disease; rose-spots were present and the Widal reaction was obtained. There was profuse diarrhœa during the first two weeks of the illness. Death occurred on the thirty-second day. There was no ulceration of the intestine and the Peyer's patches appeared to be normal, but the mesenteric lymph glands were enlarged. Cheadle states that the typhoid bacillus was cultivated from the spleen. Lartigau has reported two very carefully studied cases in which, though death followed in three weeks the onset of symptoms, lesions of the intestine were not found. The first case[20] is that of a man 36 years of age who died on the twenty-first day of his illness. There was at no time diarrhœa, abdominal pain nor tenderness. At autopsy the mesenteric lymphatic glands and the spleen were enlarged and microscopically presented the changes usually found in typhoid fever. The liver contained necrotic foci and so-called lymphoid nodules. The typhoid bacillus was carefully identified in the heart's blood, lung, liver, gall-bladder and spleen. The second case,[21] a man 51 years of age, died during the latter part of the third week of his disease. Chronic interstitial nephritis, heart hypertrophy and broncho-pneumonia were found at autopsy. Though the intestine was free from lesion the typhoid bacillus was cultivated from the liver, gall-bladder, kidney and urine.

Few of the cases which have been cited furnish evidence that the typhoid bacillus can enter the body in the absence of intestinal lesions. In view of the cases of Cheadle and Lartigau, perhaps those of DuCazal and Pick, this possibility cannot be denied, but our case suggests that even in these, lesions may have been present at the onset of the disease. The difficulty of proving that micro-organisms enter through an exposed surface which remains healthy is obviously great, and the study of this group of cases does not conclusively prove its occurrence. On the other hand, they do not show that the organism can enter by any path other than the intestinal canal. From a histological study of the lesions of typhoid fever Mallory[22] thinks it probable that the lesions of the Peyer's patches, of the mesenteric glands and of the other organs are caused by toxic products absorbed from the intestine by way of the lymphatic apparatus. Even should this explanation be accepted the group of cases which we have studied does not demonstrate beyond doubt, that these toxic products can enter without producing any lesion of the intestinal wall. They nevertheless emphasize the fact that the localization of the typhoid bacillus is not exclusively in the lymphatic apparatus of the intestine and the intestinal lesions of fatal cases may be so slight that at the time of autopsy they are no longer recognizable.

Discussion.

Dr. Futcher.—I would like to say in regard to the clinical aspect of this case that it illustrated very well the hopelessness of endeavoring to counteract the tendency to bleeding in these cases where a hæmorrhagic diathesis occurs, just as one is almost helpless in hæmophilia. We tried all the usual methods to stop the bleeding in this case; first, by attempting to increase the coagulability of the blood by calcium chloride administered internally and later by using carbonic acid gas inhalations; second, by the local treatment, such as the local application of suprarenal extract to the nostrils and the injection of a 5 per cent solution of gelatin in normal salt solution.

[16] Berl. klin. Wochensch., 1896, xxxiii, p. 666.
[17] New York Med. Jour., 1899, lxx, p. 158.
[18] Loc. cit.
[19] Lancet, 1897, ii, p. 254.
[20] Bulletin of the Johns Hopkins Hospital, 1899, x, p. 55.
[21] New York Med. Jour., 1899, lxx, p. 158.
[22] Journal of Experimental Medicine, 1898, Vol. iii, p. 611.

All measures failed except the packing of the nares both anteriorly and posteriorly, which was finally resorted to.

It is the second case of hæmorrhagic typhoid we have had here. When Dr. Hamburger reported the first case 685 cases of typhoid had been treated in this hospital. This case makes the second one out of a total of over 1000 cases of typhoid which have been under treatment. Its rarity is also illustrated by Ouskow's statistics which gave four deaths from hæmorrhagic diathesis in 6513 cases of typhoid fever. The hæmorrhagic diathesis may manifest itself early in the typhoid attack but more commonly it appears late in the disease. It is rather a fatal complication but some cases do recover, as did our first one.

DR. WELCH.—I think Dr. Opie's careful analysis of the reported cases covers the ground completely and brings up a number of points of interest. I was especially interested in four of the groups he specified, namely, the group in which the lesions were so slight, as in his case, that they might be readily overlooked; those in which the patient has died at a time when one might readily suppose that the intestinal lesion had healed; cases with only one or two ulcers, perhaps in an unusual situation, as in the vermiform appendix or the large intestine; and the group in which there is a remarkable persistence of the presence of the organisms after disappearance of the intestinal lesions.

I think there is no question that cases of typhoid infection can occur without ulceration of the intestines. Clinically certain cases are so very mild that it is reasonable to think, and the idea is not a new one, that there is no actual ulceration, but merely an infiltration of the solitary follicles and Peyer's patches. Then, the persistence of the typhoid bacillus after recovery from the intestinal lesions is illustrated by a number of observations. We have had instances here of such persistence for months and indeed for years after recovery from the disease. We know now that typhoid bacilli may persist in the urine, even without any cystitis, long after the patient is apparently well, and it is certain that they may remain a long time in the gall-bladder.

In the present case a less careful pathological study would have led to its report as one entirely without intestinal lesions, and it is quite proper, I think, that Dr. Opie should express doubt, and indeed a certain degree of skepticism, whether if this very minute study had been carried out in all the cases there would not have been found in some of them some small lesion of the intestine.

FREQUENCY OF TYPHOID BACILLI IN THE BLOOD.[1]

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Following the discovery of Bacillus typhosus by Eberth (1) in 1880, numerous attempts were made to isolate the organism from the patient's blood. Probably the first successful attempt was that by Fränkel and Simmonds (2), who, in 1885, reported one positive result in six cases. The same year Wissokowitsch (3), by animal experimentation, showed that most bacteria, including Bacillus typhosus, when inoculated into the circulating blood, unless in overwhelming numbers, very quickly disappear from the blood and find lodgment, especially in the liver, spleen and bone-marrow. Following this work repeated attempts to obtain the bacilli from the blood were still made by many observers, some with long series of cases, mostly with entirely negative results. These observations in connection with the work of Wissokowitsch led to the general acceptance of the view that the typhoid bacillus entered the general circulation only very rarely and then very quickly disappeared. During the next ten years quite a number of isolated cases of typhoid septicæmia were reported in which the bacillus was isolated from the blood either during life or at autopsy.

The first series of cases in which the technique in obtaining the cultures was good, and identification of the typhoid bacillus fairly certain (although agglutination was not tested), was that of Kühnau (4), who, in 1897, reported 41 cases, in 11 of which he obtained the typhoid bacillus from the blood during life. He knew of the work of Stern (5) and others on the germicidal properties of the blood, and, therefore, at once diluted the blood in 50 cc. of bouillon, and from this at once made plates, usually 20 in number. Other observers have failed to find them in so considerable a proportion of cases, so that only within the past few months, Scholz and Krause (6), in an article on the clinical value of present bacteriological methods in typhoid fever, after reviewing the work on isolation of the bacillus from the stools, urine, rose-spots, etc., state that cultures from the blood of typhoid patients are of no value for diagnosis, since only in rare cases are the bacilli found in the blood.

However, considering the wide distribution at autopsy, the frequency of the bacilli in rose-spots, as shown during the past two years by Neufeld (7), Curshmann (8) and Richardson (9) (in 32 out of 40 cases by the three observers), their frequency in the urine (in about one-fourth of the cases, as shown by Richardson (10), Gwyn (11), Horton-Smith (12) and others, my own observations being 17 times in 49 cases), and their having been found in lesions in almost every organ and bone of the body, it has seemed probable that they must

[1] Read before the Johns Hopkins Hospital Medical Society, February 4, 1901.

be present, in some stage of the disease at least, not only in the blood of the rose-spots, but in the general circulation as well.

With a knowledge of the work of the previously mentioned observers, I have, during the past few months, made a series of cultures from the circulating blood of typhoid patients. The technique briefly was as follows: The skin over the anterior surface of the arm at the bend of the elbow was carefully cleaned with green soap and water, followed by alcohol, ether, bichloride of mercury (1-1000), and a hot compress soaked in the latter solution applied for from one-half to one hour. It was found by experience that the *hot* compresses were of considerable importance in causing dilatation of the superficial veins. When ready to take cultures, the bichloride was removed by sponging with sterile water. In a few cases the skin over one of the veins was incised and vein dissected out before inserting needle. This is usually a very unnecessary procedure, giving the patient a great deal of pain and apparently increasing rather than decreasing the chances for contamination. The only case in which my cultures were contaminated was one in which this was done. By thoroughly cleaning the skin and hands of the operator and by touching the needle only with sterile forceps, never with the fingers, and by working with as little delay as possible, all danger of contamination can be avoided. Just before inserting the needle the arm is grasped tightly below the shoulder by a nurse or assistant and the needle is quickly inserted into one of the superficial veins. By using a small needle and entering the vein with one thrust there is no more pain in obtaining 8-10 cc. of blood than in the administration of a hypodermic or in the puncture of the ear. In all cases 8-10 cc. of blood were withdrawn and, after removal of the needle from the syringe, the blood was divided among a number of tubes or flasks filled with bouillon. At first tubes were used but in the last six cases, Erlenmeyer flasks, each containing 150 cc. of bouillon, were used. One to six flasks were used for each case, so that the dilution of the blood was from 1-75 to 1-150. The flasks were then shaken and placed in the incubator and after 24 hours, if cloudy, agar plates were made. Usually the organisms in the bouillon were somewhat clumped, at least sluggishly motile, and so not suitable for trying serum reaction.

The diagnosis of Bacillus typhosus in each case was decided by motility, staining properties, typical growth on agar, glucose agar, gelatin, litmus milk, bouillon, Dunham's peptone solution (which after one week's growth was used for indol test) and finally, agglutination by known typhoid human serum, dilution 1-50, in one hour. Frequently a fairly definite conclusion can be reached in 36 hours after obtaining the culture. If the bacilli grow out in the bouillon in 24 hours, they can be transferred at once to the various media, and from the slant agar after 6-8 hours, a suspension in bouillon can be made in which the serum reaction can be tried.

The table on opposite page gives a list of the cases from which cultures were made with the results, and also the results of urine cultures and Widal tests on the same cases.

Cultures were made from fifteen cases, in eleven of which the typhoid bacillus was cultivated. From the last seven cases in which a greater dilution of the blood was made, the bacillus was obtained every time. The cases included both those of moderate severity as well as those of great intensity. Five of the eleven cases in which the results were positive subsequently died, so that apparently cultures were taken from the more severe cases, though this was rather accidental than intentional, as they were chosen at random. Three of the cases in which the organisms were isolated had very light attacks. In one of the negative cases (VI) the cultures were contaminated with air organisms. In this case the skin was incised and vein dissected out. The child was not very ill and was removed from the hospital before a second culture could be taken. In one negative case (VII), in which cultures were taken on two occasions, the course was prolonged and of great severity. One of the other negative cases (VIII) was also one of very great severity and cultures were taken on three different occasions with a negative result each time. This patient was pregnant and aborted on the twelfth day, and the negative results are especially surprising and unfortunate since Dr. Lynch succeeded in isolating the typhoid bacillus from the blood of the fœtus. This patient's urine also contained typhoid bacilli. The organisms must have been in the blood during at least a part of the time and the failure to grow is hard to understand. It may be mentioned that this was one of the earlier cases and only bouillon tubes were used in which to dilute the blood. In all of the cases, with the exception of the two last mentioned, cultures were made on but one occasion.

The positive results were obtained at various stages of the disease, most of them during the second week, the earliest on the sixth day, the latest on the twenty-seventh day, the latter being on the second day of an intercurrent relapse.

In five cases (II, IX, XII, XIII, XIV) the cultures were positive before a positive Widal test (dilution 1-50 in one hour) was obtained. In one case (XI) the record of the date of positive Widal test has been lost.

Cultures were made from the urine of twelve of the fifteen cases and the bacilli were isolated from six, two of these, however, at autopsy.

The cases were all clinically those of typhoid excepting two.

One of these (IX) was a case which developed a continuous temperature while in the hospital on the gynecological service during convalescence from an operation for pelvic inflammatory disease. The Widal reaction was positive 1-10, negative 1-50. The symptoms were those of intra-abdominal inflammation, there was a possibility of intestinal tuberculosis, and, while typhoid was suspected, the diagnosis was not at all certain. Cultures were made from the blood twenty-four hours before death and the typhoid bacillus isolated—too late however to make the diagnosis during life. The autopsy showed typical intestinal lesions of typhoid.

The other (XIV) was a very acute case which entered the hospital actively delirious, with some rigidity of the neck and other signs of meningeal involvement, and with definite signs

TABLE.

Number.	Name.	Admitted day of disease.	BLOOD CULTURES. Day of disease.	No. cc. blood.	Medium.	Method.	Result.	WIDAL TEST.[1] Day of disease.	Result.	URINE CULTURES. Day of disease.	Result.	Discharged or died.	Day of disease.	REMARKS.
I	W.	5	24	10	6 Bouillon tubes.	Vein dissected out. Plates after 24 hrs. Quite numerous colonies on 4 plates, 2 negative.	B. typhosus.	6	Positive.	20 33	Negative. Positive.	Discharged.	81	Prolonged course. Intercurrent relapse. Relapse. Blood culture on second day of intercurrent relapse.
II	Ru.	22	27	8	6 Bouillon tubes.	Agar plates from each tube after 24 hrs. Growth of 5 colonies on one plate. Others negative.	B. typhosus.	24 28 31	Negative. Suggestive. Positive.	62	Positive.	Discharged.	78	Very prolonged course. Never extremely ill.
III	Gr.	12	14	10	6 Bouillon tubes.	After 24 hrs. all tubes cloudy. Agar plates from each tube. Colonies on all plates.	B. typhosus.	13	Positive.	26	Negative.	Discharged.	79	Rather prolonged course.
IV	Rh.	9	16	8	6 Bouillon tubes.	Tubes clear after 24 hrs. Agar plates from each tube. No growth on any plates.	No growth.	11 17	Negative. Positive.	12	Negative.	Discharged.	43	Light attack. Never very ill.
V	D.	7	10	8	5 Bouillon tubes.	After 24 hrs. 2 tubes cloudy. Agar plates from all tubes. Colonies on plates from 2 tubes.	B. typhosus.	10	Positive.	....	.....	Death.	15	No complications. No autopsy.
VI	M.	10	16	10	6 Bouillon tubes.	Vein dissected out. Culture obtained with much difficulty.	Contamination.	11	Positive.	....	.....	Left the hospital.	18	Patient not very ill. Left before second culture could be made.
VII	Bu.	15	19	10	6 Bouillon tubes.	Agar plates after 24 hrs.	No growth.	16	Positive.	20	Negative.	Discharged.	65	Prolonged course with relapse.
			25	8	6 Bouillon tubes.	Agar plates after 24 hrs.	" "							
VIII	Br. O.	8	9	10	7 Bouillon tubes.	Vein dissected out.	No growth.	11	Positive.	12	B. typhosus.	Discharged.	72	Severe case. Abortion. See reference in text.
			15	8	7 Bouillon tubes.	Skin not incised.	" "							
			23	8	7 Bouillon tubes.	Skin not incised.	" "							
IX	Bo.	12	16	8	6 Erlenmeyer flasks of bouillon	After 24 hrs. all flasks cloudy. Agar plates from all flasks. Colonies on all plates.	B. typhosus.	11 14	Suggestive. "	16	Negative.	Died.	17	See reference in text.
X	McC.	9	20	2	1 Erlenmeyer flask of bouillon.	Agar plates after 24 hrs. Colonies on all plates.	B. typhosus.	9	Positive.	11	Negative.	Died.	25	Severe case. Hæmorrhage, Pleurisy, Perichondritis of thyroid cartilage.
XI	Br. M.	4	10	10	4 Erlenmeyer flasks of bouillon.	Growth in one flask. Others negative.	B. typhosus.	4	Suggestive.	....	.....	Discharged.	41	Light attack.
XII	R.	5	6	2	1 Erlenmeyer flask of bouillon.	Agar plates after 48 hrs.	B. typhosus.	6 14 48	Suggestive. " Positive.	21	Negative.	Discharged.	49	Attack of moderate severity.
XIII	G.	9	14	8	4 Erlenmeyer flasks of bouillon.	After 24 hrs. all flasks cloudy. Growth from all flasks.	B. typhosus.	10 18	Suggestive. Positive.	39	B. typhosus.	Discharged.	45	Attack of moderate severity.
XIV	Hl.	10	11	8	3 Erlenmeyer flasks of bouillon.	Growth in all flasks.	B. typhosus.	12	Negative.	At autopsy.	B. typhosus.	Died.	11	See reference in text.
XV	Ha.	11	12	8	2 Erlenmeyer flasks of bouillon. 5 bouillon tubes.	Growth in all flasks and tubes.	B. typhosus.	11	Positive.	At autopsy.	B. typhosus.	Died.	15	Course rapid and severe. No complications. Patient lived but four days after entrance to hospital.

[1] By positive Widal test is meant complete agglutination in one hour with a dilution of 1–50, microscopical method.

in the chest of lobar pneumonia. The Widal test was entirely negative. The history did not suggest typhoid, and, in the presence of the lung signs, it was supposed to be only a case of lobar pneumonia with marked cerebral symptoms. The patient was admitted during the evening and on the following morning spinal puncture was performed, the fluid obtained being perfectly clear and free from organisms. At the same time cultures were made from the blood. The following morning in the cultures from the blood, instead of the pneumococcus, a motile bacillus resembling the typhoid bacillus was found, which subsequently was proven to be that organism. The patient had died during the night, so that, while the diagnosis was made by the blood culture, it had been taken too late to make the diagnosis during life. The autopsy showed, in addition to lobar pneumonia, well marked intestinal lesions of typhoid fever.

In the Deutsche medicinische Wochenschrift, August 9, 1900, Schottmüller, in a report of a case of fever caused by a typhoid-like organism, states that in fifty cases of typhoid fever from which he made cultures of the blood during life, he was able to isolate the typhoid bacillus forty times. He does not give the technique employed in the other cases, but states that in the case reported he used solid media, using large amounts of blood, fifteen to twenty cc. A full report is to appear later.

Auerbach and Unger in Deutsche medicinische Wochenschrift of December 6, 1900, also report a series of ten cases of typhoid in which cultures were made from the blood during life, the typhoid bacillus being isolated from seven of these cases. They also used fluid media and used quite small amounts of blood.

From all the results given, it is apparent that typhoid bacilli occur in the blood with much greater frequency and during a much longer time through the course of the disease than was formerly supposed. The conditions which favor their presence, why they are found at times in mild cases and are absent in more severe ones, are questions which must yet be solved. That cultures from the blood in typhoid fever have very definite clinical importance, especially where the Widal reaction is delayed, as is so often the case, is evident. From my experience, the use of considerable amounts of blood, diluting very largely in liquid media, and, on account of the use of the latter, especial care to avoid contaminations, are the points of chief importance.

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Discussion.

Dr. Osler.—One of the cases recorded illustrates, I think, that this method will prove to be of considerable value; I do not think that by any other means the diagnosis could have been made on the young colored girl admitted at the end of the first week with no rose-spots and nothing upon which to base a diagnosis of typhoid fever. The one thing evident was, that she had a violent, acute infection of some kind. The cultures made on the morning of admission would have given us the diagnosis positively within 24 hours, but unfortunately, in this case, the patient succumbed to the disease the same day. The earliest date in which bacilli were found was the 6th day of the disease. The number of bacilli, however, could not be determined.

Dr. Welch.—That is a misfortune of the method. The statement has been made that the Widal reaction is most likely to be absent when there are many bacteria in the blood. It has been contended by some that there is an antagonism between a large number of bacilli circulating in the blood and the Widal reaction.

Dr. Cole.—In six of the cultures the bacilli were found in the blood before the Widal reaction was present.

A PORTABLE OPERATING OUTFIT.

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and

Omar Pancoast, M. D.

Every surgeon who has been compelled to operate often in private houses, sometimes several hundred miles from any large hospital, appreciates fully the difficulties of the problem: how shall we manage to preserve a careful technique and approach the methods of a hospital operating room without too great expense, delay and inconvenience? In order to

remind the general practitioner of some of the chief difficulties, it may be well to mention some of the many sources of delay and vexation.

FIG. 1.

flights of stairs away; of two smaller tables placed together, frequently of uneven heights and much too broad; or of an ironing board placed insecurely on the backs of chairs or on small tables. All of these things may have to be brought from distant parts of the house and are frequently needed for other purposes, such as to hold supplies, basins, etc. Another frequent difficulty is an insufficient supply of clean basins to contain the various solutions necessary for hand disinfection, instruments, etc. It may become necessary to borrow from the neighbors and often to waste considerable time in rendering them fit for surgical use.

For a long time we have been in the habit of always taking a trunk with us to carry the necessary supplies and basins, but as the basins in regular hospital use are not generally of such sizes as to be easily and closely packed, we have often

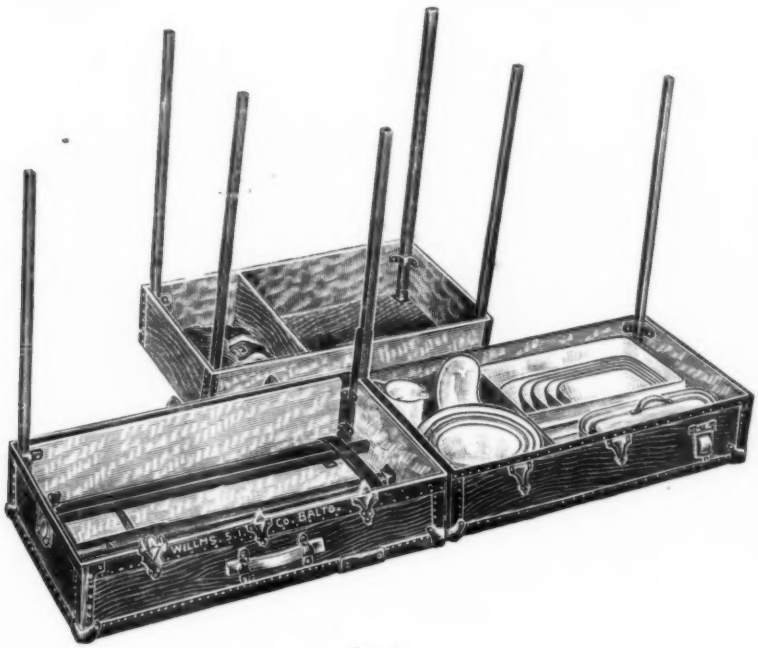

FIG. 2.

The surgeon of course carries with him a supply of instruments, dressings, materials for anesthetizing the patient and for preparing the field of operation. Sometimes these are carried in a trunk, sometimes in a hand-bag or telescope-satchel or in several such satchels.

On arriving at the house of the patient usually one first endeavors to procure something that will do service as an operating table. For any major operation the table should answer the following requirements: It should be sufficiently strong; it should be sufficiently high, so that one should not be compelled to stoop; it should be so narrow that the operator and assistant may stand on opposite sides and work in a comfortable unstrained position.

As a rule, one finds himself compelled to make use, either of the kitchen table, broad and low and perhaps several

considered the advisability of obtaining a complete set of basins for outside work and then having a trunk made to contain them, the instrument kettle and various necessary supplies, all in separate compartments to prevent shifting when the trunk is roughly handled.

In the trunk we present to-night we have accomplished these purposes and in addition have been able to add three very useful features. We have had the trunk so constructed that it can be readily converted into a very satisfactory table; we have had the tray so made that it forms a perfectly suitable table for instruments or basins; and we have also had made a skeleton Trendelenburg which when extended and covered with canvas may be placed on the trunk-table, converting it into a Trendelenburg operating table. We have accomplished these purposes by having the depth of the trunk increased

but two inches beyond that required for the ordinary supplies. The exact methods by which we obtain these results are made clear by the accompanying illustrations.

A few words perhaps are necessary to explain our method of using this outfit.

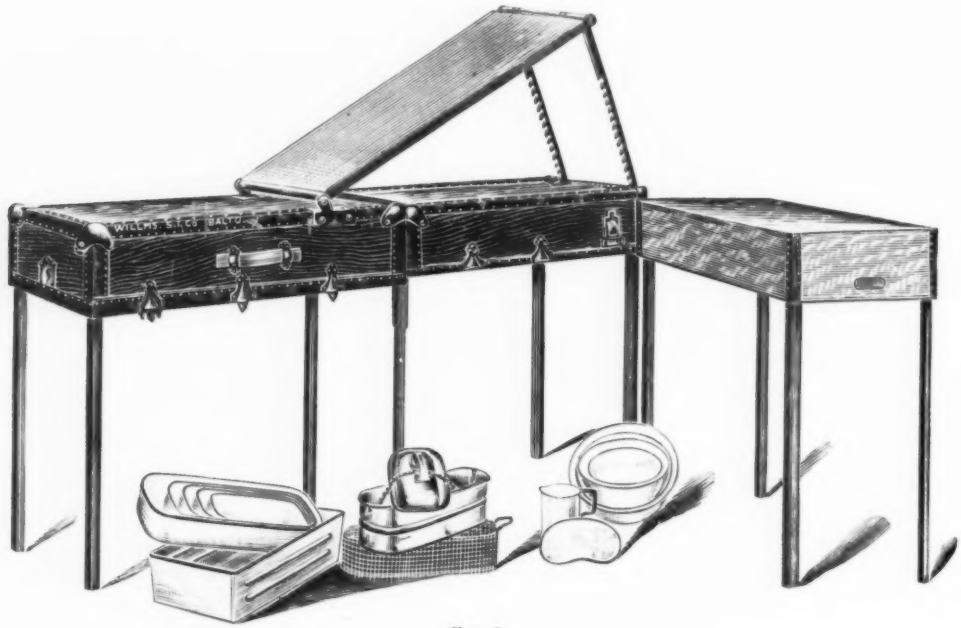

Fig. 3.

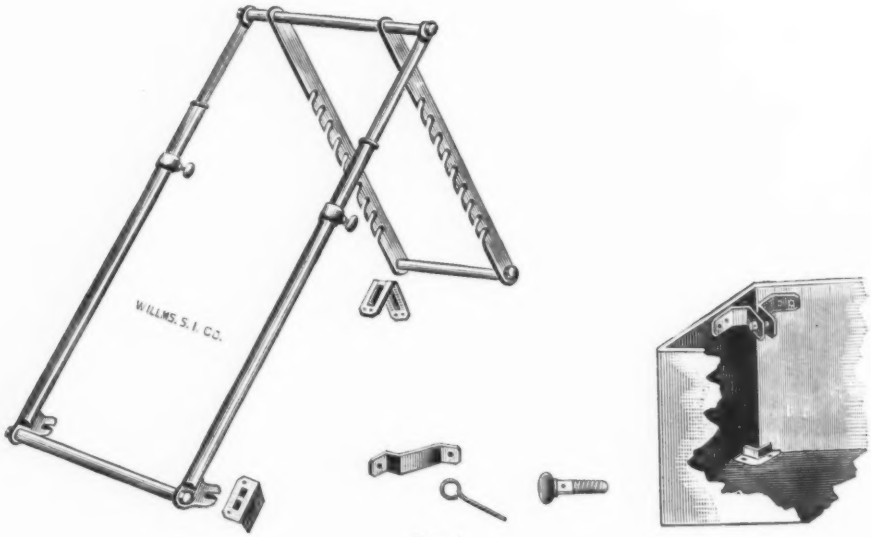

Fig. 4.

The large arm basin containing four or five instrument trays is immediately filled with a 1-1000 solution of bichloride of mercury and the trays are thus sterilized by soaking. When taken out, each may be covered with a sterile towel or tray cover. The largest of the round basins is filled with bichloride solution and the smallest of this set is sterilized by soaking in the same manner. The large basin is finally used for the operator's hand-basin of bichloride and the small one for sterile water, salt solution or sponges as the occasion requires. Two of the round basins are used for the saturated solutions of permanganate of potash and oxalic acid. The remaining one is for the soap and water used in shaving and cleaning the site of operation. The instruments are carried packed in the kettle and so may be boiled at once.

In order to form a rigid table the trunk when open is

securely fastened in this position by a thumb screw, as shown in the figure. The legs after insertion may be clasped very tightly by a few turns of the screw which regulates the size of the opening in the corner castings.

The table is usually covered with a folded blanket, mackintosh, sheet, and a Kelly or Morrison pad which drains into a bucket on the floor. When the Trendelenburg is used the trunk is protected by a mackintosh alone, while a pillow is placed over the cross rod of the Trendelenburg to protect the patient's head and shoulders.

The various chemicals necessary are carried in ordinary mailing cases so as to avoid the danger of breakage when glass bottles are carried. We use the wooden cases with screw top after carefully washing them and removing the wadding and paraffin. Sterile concentrated salt solution, cocaine, etc., are carried in bottles in mailing cases and are previously sterilized by the following process: A cork is put lightly in the bottle containing the solution and the whole top of the bottle and cork are then covered with an absorbent-cotton shield fastened around the neck of the bottle. After sterilization the cork is pushed home through the cotton and the solution remains sterile indefinitely.

In conclusion we beg to express the hope that this trunk may be of service to other surgeons and be one means of introducing a more perfect technique in "outside" operations.

FINNEY-PANCOAST OPERATING TRUNK.

Dimensions of Trunk closed,	35″ long,	18¾″ wide,	15¼″ high.
" " " as table,	70″ "	18¾″ "	35″ "
" " Tray " "	31¼″ "	16⅝″ "	34″ "
Trendelenburg. Length closed,	31″		
" " open,	41½″		
" Width,	17″		
" Height of Elevation,	21″		
Weight of Trunk with Tray,	60½ lbs.		
" " Trendelenburg with Canvas,	13¼ lbs.		
" " Tray,	9½ lbs.		
" " Legs for Trunk,	8¼ lbs.	} 12½ lbs.	
" " " " Tray,	4¼ lbs.		
" " Full set of Basins, Instrument Trays, Boiler, &c.	27 lbs.		
" " Rubber Sheeting,	2¼ lbs.		
Gross weight of Trunk and contents,	115½ lbs.		

ULCER OF THE STOMACH CAUSED BY THE DIPHTHERIA BACILLUS.[1]

BY WILLIAM R. STOKES, M. D.

Although the diphtheria bacillus has been known as the cause of various inflammations of the respiratory tract for some little time, yet it has but recently been described in connection with such atypical conditions as diphtheritic inflammation of the conjunctiva and the external auditory meatus. Diphtheritic infection of wounds of the skin and diphtheritic vulvo-vaginitis have also been observed, but these rare infections are all completely described in "Osler's Practice of Medicine," or in Baginsky's article on Diphtheria in "Nothnagel's Specielle Pathologie and Therapie."

Schoedel (1) has recently reported a case of fibrinous inflammation of the gastric mucous membrane, due to the diphtheria bacillus, and as I have also found a gastric ulcer caused by this organism at the autopsy in a case of proven tonsillar diphtheria, I shall first refer to Schoedel's (1) article somewhat in detail.

This writer first reviews the literature, mentioning the fact that Klebs (2) and Loeffler (3) have both described cases of gastric diphtheria, in which they demonstrated their bacilli in stained sections. Wright (4) also found diphtheria bacilli in the stomach in two out of fourteen autopsies on diphtheria.

Schoedel's case was that of a child who died of faucial diphtheria without any gastric symptoms. The uvula contained a grayish membrane, but the esophagus was normal. The mucous membrane of the stomach was very red and covered here and there with a gray adherent membrane. The lymphatic structures of the intestine were swollen. A culture from the membrane made on Loeffler's blood serum showed a large number of typical diphtheria bacilli, and these were also demonstrated in stained sections. This writer also found virulent diphtheria bacilli in the stomach of two children, dead from diphtheria, and in one of eight cases he was able to demonstrate the bacillus in cultures from the feces by means of its typical bipolar stain.

Schoedel thinks that the acid gastric juice can usually destroy a small number of diphtheria bacilli when they are swallowed, and that primary diphtheria of the stomach is thus well nigh impossible. In cases of widespread diphtheria, however, when the gastric acid is lessened in amount, large numbers of diphtheria bacilli are apt to bring about some local lesion of the mucous membrane of the stomach, when once swallowed. Although these cases are not usually detected at the bedside, their existence should not be lost sight of by the clinician.

The case which I desire to describe occurred in November, 1900, and as the young man was picked up off the streets suffering from well-marked diphtheria and housed in a vacant room in the Health Department, the clinical history is necessarily meager. All that could be obtained, however, was recorded, and I am indebted to Dr. C. Hampson Jones, Assistant Commissioner of Health, for his clinical report upon the case.

CLINICAL REPORT.

The patient was found on the streets and was referred to the Department of Health for treatment, owing to the fact that there is no infectious hospital in the city.

[1] Read before the Johns Hopkins Medical Society, January 21, 1901.

Cultures taken from the throat on two separate occasions showed the presence of diphtheria bacilli. A cot was provided for the patient in a vacant room and a nurse was placed on duty.

The fever remained high for several days, and the membrane gradually disappeared from the tonsils, as the patient received 10,000 units of antitoxin in about four days. About the sixth day of treatment, and when the membrane had almost disappeared from the throat, the temperature fell, and even became subnormal. The patient also complained of pain and hyperæsthesia in the epigastric region, and died about ten days after being admitted for treatment at the Health Department. It was impossible to find out how long the patient had suffered from diphtheria before he was seen at the Health Office.

Report upon Autopsy.

The autopsy was performed by Prof. N. G. Keirle, Medical Examiner, who has kindly allowed me to use his notes.

Post-mortem held at the morgue on November 18, 1900. R — S—. Age twenty-three years. Ante-mortem statement. History of epilepsy. Autopsy record. Inspection. Yellow pseudo-membrane on fauces, velum and right tonsil.

Brain.—Hyperemia and edema. Pia thickened and adherent to corpus callosum, which it tears on removal.

Lungs.—Hyperemic. They ooze freely a frothy blood-stained serum. The lower lobe of the right lung is solidified. This solidification was not exactly that of lobar pneumonia, but consisted of large solidified areas, separated by a looser edematous tissue in places almost normal in appearance. The pleura was smooth.

Heart.—Normal. Hemoglobin staining of the intima of the aorta and pulmonary arteries.

Liver.—Fatty, and kidneys coarse, thick and yellow.

Cortex shows cloudy swelling.

Stomach.—This shows an ulcer two and a half cm. by one cm. near the pylorus in the most dependent portion of the greater curvature of the stomach. It is covered with a dark yellow membrane, in places almost black. The surface is necrotic beneath. The rest of the mucous membrane of the stomach was normal in appearance, and the intestines were also normal.

Cause of Death.—Septicemia of diphtheritic origin.

Histologic Description.

Before describing the interesting changes which were found in the stomach, a brief report upon the changes in the various other tissues and viscera will be given.

The Right Tonsil.—The right tonsil when stained by hematoxylin and eosin shows a well-marked dilatation and congestion of the numerous blood spaces present throughout the organ. These are packed full of red blood corpuscles, and are often dilated to the size of a small vein. They are very numerous, and are usually simply surrounded by a single layer of endothelial cells. The normal stratified epithelium has disappeared over a large portion of the surface of the tonsil, and this loss of substance ends rather abruptly at one side of the section in normal epithelium. The epithelial cells are simply replaced by a thin band of connective tissue containing many round, oval or spindle-shaped newly formed connective-tissue cells. There are few, if any, pus cells and no fibrin present, and beneath this newly formed tissue the lymphoid masses of the normal tonsil can be seen. The entire appearance is that of healing inflammation of the surface of the tonsil.

On staining the tonsil by Weigert's bacterial stain a moderate number of foci of bacteria can be demonstrated on the surface. These consist both of bacilli and cocci. These cocci probably are the staphylococcus pyogenes aureus, and they must have entered the circulation from this area, as a few colonies of a similar organism were found in the spleen and blood of the heart by cultures on blood serum. The bacilli are specimens of diphtheria bacilli, as demonstrated by cultures. Stained sections of the other tonsil showed nothing of interest.

Other Viscera.

There is a well-marked, cloudy swelling of the liver present, but no other changes are noted in this organ. The kidney shows pronounced congestion of the capillaries, both between the tubules and in the glomeruli of the capillaries, and a few hyaline and granular casts are present in the tubules. The spleen shows slight congestion, and the splenic spaces are distended by proliferated endothelial cells. The heart muscle and brain show nothing unusual. No bacteria could be stained in any of these organs.

Lungs.

Sections taken from the more solid areas mentioned in connection with the lung showed the following condition:

The small blood-vessels and veins show well-marked congestion, and the air cells are usually filled with an edematous fluid often containing many pus cells. In some areas the pus cells entirely fill up the air sacs, causing an appearance similar to that seen in the stage of gray hepatization in lobar pneumonia. The bronchi are normal, and there is no fibrin present. In specimens stained by Weigert's method a moderate number of diphtheria bacilli can be seen both in the edematous fluid, and in the more densely packed masses of pus cells. Some of these bacilli are within the protoplasm of the neutrophilic leucocytes. There are also present a large number of short chains of streptococci, which were not detected in the cultures from the lung.

Illustration Showing a Section made through the Edge of the Gastric Ulcer:

The rest of the ulcer shows about the same changes, and its surface consists entirely of necrotic tissue. This tissue contains numerous diphtheria bacilli. The ulceration has only extended as far as the muscular coat, where regeneration has already begun. The hyaline degeneration of the submucous coat and the eroded blood-vessel are well shown in the illustration, which also shows the necrotic tissue, and the overhanging mucous membrane.

Figure No 1.

A. Peritoneal Coat.

B. Muscular Coat.

C. Submucous coat, showing superficial necrosis, hyaline degeneration, and regeneration of the base of the ulcer.

D. Layer of fibroblasts at the base of the ulcer.

E. Hyaline degeneration of the submucous coat.

F. Layer of polymorphonuclear leucocytes invading the necrotic area.

G. Superficial layer of coagulation necrosis which contains many diphtheria bacilli.

H. Hemorrhagic area in the submucous coat.

I. Muscularis mucosæ ending abruptly at the margin of the ulcer.

K. Mucous coat ending abruptly at the margin of the ulcer.

L. Artery of submucous coat showing hyaline necrosis of the walls and infiltration with leucocytes.

M. Peptic glands in the mucous membrane.

Stomach.

The ulcer of the stomach mentioned in the account of the autopsy consists of an extensive mass of coagulative necrosis, which has entirely replaced the mucous membrane. This necrotic area extends well down into the submucosa, and laterally it has undermined the mucous membrane. This overhangs the necrotic area on either side. Beyond the necrotic material, and limiting the extension of the lesion in the submucosa on either side of the ulcer, the tissue has undergone hyaline degeneration, only a few strips of connective tissue having still retained their nuclei. Portions of this hyaline tissue are dotted with small irregular hemorrhages. This thin strip of hyaline degeneration and hemorrhage extends from the sides to the bottom of the ulcer, forming its base, and separating the ulcer from the normal muscular coat beneath. That portion of the base just adjacent to the normal muscle is richly infiltrated with newly formed connective-tissue cells of various sizes and shapes, indicating the beginning of regeneration at the base of the ulcer. The base of the coagulative necrosis in the ulcer contains a moderate number of pus cells. On applying Weigert's fibrin stain no fibrin could be demonstrated in the sections.

Bacterial Stains.

When the sections of the ulcer are stained for bacteria by Weigert's method, a remarkable appearance is presented. It might be remarked in passing that these sections were first stained by hematoxylin and then by eosin, according to the usual method, and after washing out the excess of eosin in water the sections are mounted on a slide and stained with gentian violet. The other well-known manipulations of Weigert's bacterial stain are then applied and the section is mounted in balsam. This triple stain differentiates all of the histological features in a satisfactory manner, while the bacteria which stain by Gram's method are clearly shown.

The diphtheria bacilli in the stained sections are limited to the necrotic material, and are more numerous on the surface of the ulcer. They are irregularly distributed throughout the entire area of necrosis, but are so densely packed together in a meshwork on the surface as to render individual inspection of bacilli impossible. Many of these organisms are very long, and some are spiral shaped. They are about the width of the diphtheria bacillus, however, and may be long forms. Most of the bacilli present the usual appearance of diphtheria bacilli in cultures, but there are some rather large square-ended organisms about the size of an anthrax bacillus, which may be unknown organisms which failed to grow in the culture from the ulcer. Even under the low power of the microscope the masses of bacilli are quite apparent on the surface, as homogeneous, or scattered blue foci. On examining the border of contact between the necrosis and the thin line of pus cells, the abrupt ending of the bacilli just at the line of contact with the neutrophilic leucocytes might well answer to the fanciful description of two armies just about to engage in a battle.

Just a few bacilli can be found on the extreme edge of the line of pus cells, and only here and there can one be found within the protoplasm of the leucocytes.

Bacteriological Examination.

The bacillus isolated from the right tonsil was subjected to the following tests:

A coverslip from a pure culture on blood serum was stained by Loeffler's methylene-blue, and the bipolar, or interrupted staining, was very apparent. A pure culture was obtained, and inoculated into 1 per cent lactose bouillon. This was acidulated in 24 hours. Gelatin was not liquefied, and the organism was not motile.

Cultures from the ulcer of the stomach and the lungs also contained numerous diphtheria bacilli. The liver and kidney contained many colon bacilli, and the spleen and the heart showed a few colonies of staphylococcus pyogenes aureus.

One cubic centimeter of a 24-hour bouillon culture of the bacillus isolated from the ulcer of the stomach was injected subcutaneously into the abdominal tissues of a guinea-pig. The animal died in 6 days, and the seat of inoculation showed a gray necrotic area the size of a dime. Under the microscope this area consisted of a mass of polymorphonuclear leucocytes which not only formed a thick layer on the surface of the muscle, but which have also infiltrated the abdominal muscle, forming collections of cells between the muscle bands and fibres. On staining this tissue by Weigert's method numerous diphtheria bacilli can be demonstrated. Many of these show large club-shaped ends, and in a few the bipolar stain can be seen. Cultures made on blood serum from this area gave a pure growth of the diphtheria bacillus. The lungs showed marked active congestion, but the air cells were free from any exudate. The rest of the viscera were normal.

Summary.

It is a point of some interest to note that the stomach is not always able to destroy large numbers of diphtheria bacilli, especially when the powers of resistance have been lessened by an acute disease.

The ulcer which was found was certainly produced by the diphtheria bacillus, and it may appear later that these stomach lesions are not as rare as was formerl thought.

In conclusion I desire to thank Prof. N. G. Keirle for his kindness in allowing me to use his autopsy material.

Literature.

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OVARIAN ORGANOTHERAPY.[1]

BY WILLIAM KRUSEN, M. D., Philadelphia, Pa.

The organs, tissues, and secretions of animals were extensively employed as therapeutic agents by the ancients, and constituted a prominent part of their disgusting and nauseating medicinal armamentarium. Pliny informs us that the ancient Greeks and Romans ate the testicles of the ass for the purpose of curing impotence, forestalling the later investigations of Brown-Sequard by hundreds of years. In 1852, Dr. Jackson of Philadelphia made a definite attempt to apply animal tissues to the cure of disease by administering the blood of bullocks carefully dried in vacuo, in five to ten grain doses, as a tonic. The use of glandular extracts was revived in 1889 by Brown-Sequard's advocacy of orchitic extract for impotence and certain nervous affections; and the interest was profoundly stimulated by the results which Prof. Geo. R. Murray, of the University of Durham, in 1891, obtained by the use of thyroid extract for the cure of myxedema. Since that period medical literature has been flooded with a deluge of reports of all kinds of extracts. Cerebrine, medulline, cardine, and many others too numerous to mention, have been presented to the profession, tried in the balance of practical experience and found wofully wanting. One would not be surprised to find some enterprising and energetic drug firm vaunting the merits of musculine for pugilists and athletes, or advising political spellbinders to imbibe eloquence and gloso-labial extracts at the same draught.

The popularity of this line of medication depends upon the theory of Brown-Sequard, that all glands, whether provided or not with excretory ducts, have the power to elaborate, in addition to their ordinary secretions, certain materials of unknown chemical composition, which pass into the blood and perform therein definite functions of some kind. The efficiency of thyroid extract in the treatment of myxedema and cretinism has substantiated the theory to a certain extent, but the limitations of its application remain to be determined. The animal extracts which have a particular interest for gynecologists are the uterine, mammary, parotid, thyroid, and ovarian; and of the last of these and its value it is my purpose to speak, hoping to elicit a discussion which may prove valuable to profession and patient.

In studying the action and uses of ovarian extract it is interesting to review the conclusions of Curatulo in regard to the internal secretion of the ovary. 1. The ablation of the ovaries exercises a considerable influence on metabolism. 2. The quantity of phosphates eliminated by the urine is notably diminished after the removal of the ovaries. In reality, this diminution is not due to elimination, which is the same before and after the operation, or to the diminution of the absorbent power of the intestine; for the condition in which the gastro-intestinal tract is found is the same before as after the operation. 3. The curve of nitrogen, after ovariotomy, ascertained either by Kjeldahl's method or by Yvon's, presents a slight oscillation, without a very distinct tendency to elevation or lowering. 4. After oophorectomy the quantity of carbonic acid eliminated by the respiration, and that of the oxygen absorbed, diminish considerably up to a certain limit, from which time it remains stationary. 5. In animals from which the ovaries have been removed, the curve of the weight is progressively elevated until it attains considerable proportions from 5 to 6 months after the operation. 6. When a certain amount of ovarian juice is injected subcutaneously into sluts deprived of the ovaries, the quantity of phosphates eliminated by the urine, which diminished considerably soon after the operation, tends to increase and even to become superior to that which was ascertained before the operation; when still larger amounts are injected the quantity of phosphates increases in a very marked degree.

Hysterectomy performed in conjunction with oophorectomy does not seem to cause modifications other than those ascertained after simple removal of the ovaries. The author closes his essay with the following theory: The ovaries, like other glands of the animal economy, have, according to Brown-Sequard's general doctrine, a special internal secretion. These glands continually throw into the blood a peculiar product, the chemical composition of which is completely unknown, and the essential properties of which tend to favor the oxidation of phosphorized organic substances, of carbohydrates, and of fatty substances.

It results therefrom that, when the function of the ovaries is suppressed, whether because oophorectomy has been practiced or because the organs do not act, as is the case before puberty and after the menopause, there should be produced, on the one hand, a more considerable retention of organic phosphorus, whence there is a greater accumulation of calcareous salts in the bones; and, on the other hand, the very manifest corpulency which is ordinarily seen after oophorectomy or after the menopause.

This probably suggested the value of substitution therapy, the restoration to the diseased body of chemical substances the removal of which from the normal body gives rise to symptoms of disease. It is not necessary to review the various psychic or vasomotor disturbances which are associated with the natural and the premature menopause; they are too well known to need further comment.

Werth of Kiel was the first who made use of the ovarian treatment in troubles which accompanied the disappearance of the secretion of the ovary following either the menopause or surgical intervention. Out of ten cases, in two only did the treatment fail to bring about any result; in the other eight there was a diminution of general pains, of the headache, of the loss of appetite and sleep, of the palpitation and

[1] Read before the Johns Hopkins Medical Society, February 4, 1901.

of the feeling of anguish. Mainzer of Berlin obtained a considerable amelioration of the symptoms following double ovariotomy by administering to his patients the raw ovarian substance of the cow or the calf, in daily amounts of from 75 to 150 grains. It has been demonstrated that such large doses are not necessary. Mond has used it successfully in disorders of the natural menopause and in amenorrhea due to atrophy of the genital organs, or to neurasthenia. Spillman and Etienne also obtained good results in *chlorosis* from the administration of the fresh ovaries of sheep, of the dried ovarian substance, and of the ovarian juice. According to these authors, this treatment acted by facilitating the elimination of the toxines, increasing the red globules and causing the reappearance of menstruation. Mairet, Jayle, Touvenaint and Jouin have published observations in which this medication has led to favorable results in the treatment of amenorrhea and chloroanemia. Guerder and Vigier have found the symptoms of the natural menopause were relieved. The latter, after freeing the ovarian substance from foreign matter as fat, fibres, etc., mixed it with bicarbonate and charcoal, which preserves it indefinitely without interfering with its therapeutic effects.

Bodon (Centralblatt für Gynakologie, August, 1897) reports three cases in which he employed ovarian tablets with good effect. The third was that of a virgin, 18 years old, who had suffered with epilepsy since her first menstruation and had been under treatment for years. Bromides and other drugs had proved utterly futile. She began with one tablet daily and increased the number to ten. In the course of several months the epileptic attacks ceased; but discontinuance of the drug was followed by fresh seizures and its resumption again caused their subsidence.

Jacobs (Semaine Gynecologique, June 22, 1897), although skeptical at the beginning of his observations, had confidence in the remedy to continue its use. The extract of the ovaries of recently killed animals was used and he has tabulated 81 cases, of which only 5 are classed as failures. In one case of obesity with amenorrhea of 19 years standing, the obesity diminished and menstruation became regular. Another patient, 21 years of age, with undeveloped genitals, had never menstruated; but after taking ovarian extract for a month, menstruation appeared and has continued regularly ever since. Jacobs believes that suggestion plays a prominent part in some of these cases, though not in all. Landau (Berlin. klin. Woch., No. 25, 1896) believes that this remedy does possess the power of modifying the unpleasant phenomena of the climacteric whether physiologic or anticipated, without producing any evil effects, and that it deserves careful consideration.

Chrobak (Cent. für Gynak., No. 20, 1896) administered ovarian extract made from the fresh ovaries of cows, to a number of castrated women and had good results in two cases reported. Fosburg (British Med. Jour., April 24, 1897) gives the history of a patient who at the climacteric was much troubled with frequent and violent flushing, the face often being in a burning heat while the hands and body were icy cold. Five grain platinoids of ovarian gland, administered 3 times daily, gave complete relief before 3 dozen were taken; and one platinoid given occasionally prevented recurrence.

Seeligman (Allg. Med. Centralzeitung, No. 3, 1898) reports 15 cases treated with extract of the ovaries of sheep and pigs, and concludes that the remedy has a decidedly beneficial effect, not only upon typical climacteric phenomena, but also upon the psychic condition and upon constitutional diseases such as gout, psoriasis, etc., which after long remaining latent develop at the menopause. Bate (Louisville Journal of Surgery, vol. v, 1898-99, p. 11) states that "physiologic action of ovarian extract as now observed is vaso-constrictor, nerve sedative, emmenagogue, and anti-anemic"; a combination of qualities which, if it truly possessed them, would make it a most valuable acquisition to our pharmacopeia.

Stimulated by such enthusiastic and gratifying clinical reports I began the use of ovarian extract, employing capsules prepared by a reliable firm, since the ingestion of raw ovaries or nauseous doses is not usually appreciated by the average American woman. For the past three years, in selected cases, in dispensary and private practice, the effort has been made to obtain some definite result from the use of this carefully prepared ovarian extract, in 3 classes of cases: (1) Those suffering from amenorrhea, dysmenorrhea and other forms of pelvic disease; (2) those suffering from symptoms following the removal of the uterine appendages, for the relief of the vasomotor changes, the flushes and cardiac neuroses which, with indescribable depression, are so often produced by the premature menopause; (3) the disturbances associated with the natural menopause. My first case was that of an intensely neurotic patient suffering from artificial menopause. Marked relief was noted for a brief period; then there was a recurrence of the symptoms. Later the patient became an adherent of Christian Science and has obtained more relief from autosuggestion than from inspissated ovaries. Many other disappointing instances were met with. Patient after patient would faithfully take the extract to the exclusion of other remedies without any perceptible result, although occasionally the effect would be apparently so marked and the results so satisfactory as to encourage its further use. For instance, such a history as the following, taken from the case-book at St. Joseph's Hospital, would incite to renewed confidence in the efficacy of the preparation. Jan. 9, 1901, Mrs. A. C., aged 26 years, had had double ovariotomy performed by Dr. Joseph Price; general condition good, pelvic examination negative, but complained of hot flushes every few minutes and extreme nervousness. Five grain capsules of ovarian extract, 4 times daily, were ordered. The patient returned in 3 days stating that the nervousness was better and the hot flushes decreasing in frequency. In one week the nervousness had disappeared and hot flushes occurred only on exertion, two or three times daily. Another case in point was that of Mrs. J. W., patient of Dr. Chas. B. Smith of Newtown, Pa., who was operated upon for double pyosalpinx. Within 2 months after leaving the hospital she began with the usual vasomotor phenomena and relief was secured by the administration of 5-grain doses

of ovarian extract 3 times daily. Time and a regard for your patience prevent my giving a detailed history of more cases; besides the recital of our failures is never pleasant; yet it seems unfortunate that more of those who have been disappointed in their use of this product have not given their experience; only a few seem to have done so. Montgomery (International Med. Mag., Nov., 1900) states that he has never seen the slightest influence from the use of ovarian extract although he has found the thyroid especially valuable in the treatment of cases of myxedema, obesity, and in some forms of sterility; and Baldy says that "a careful consideration of this subject forces one to the conclusion that it is destined quickly to follow in the steps of the testicular injections urged several years ago with the object of renewing youth." Johnstone of Cincinnati may give the correct explanation of the failure to secure more definite and satisfactory results from the use of ovarine. He says: "There is not an iota of proof that the ovary has any other function than the manufacture of eggs. The ovary is in no sense a gland. Its epithelium is arranged for the purpose of being cast out and lost, and is not placed so that its secretions, if it has any, could be absorbed either by ducts or blood-vessels. Anatomically, the ovary does not resemble the suprarenal, the thymus, or the thyroid gland. The thymus is a lymphatic gland, the thyroid and the suprarenal have a rich supply of blood-vessels so arranged that each epithelial cell is closely approximated to a venous radical, thus providing for a rapid absorption of whatever secretion its cells may make. The ovary has a true duct, through which its epithelium, when cast out, passes off en masse to the outer world."

Probably Jacobs struck the keynote when he said that "suggestion plays a prominent part in some of these cases"; for this might explain why we have successes and failures under the same conditions without apparent cause. Notwithstanding the many brilliant results referred to in this paper, experience leads me to the following conclusions based upon the use of the American product upon American women: (1) The employment of ovarian extract is practically harmless, as no untoward effects beyond slight nausea have been noted even when full doses have been administered. (2) In the treatment of amenorrhea and dysmenorrhea no good results were secured. (Although in some cases of amenorrhea of obesity, remarkable results have been obtained by the use of the thyroid extract.) (3) The best results were seen in the second class of cases, for the relief of symptoms of artificial menopause, when in a few instances the congestive and nervous symptoms were apparently ameliorated. (4) No appreciable result was noticed in the use of ovarine in the natural menopause. (5) No definite or exact reliance can be placed upon the drug, as it often proves absolutely valueless where most positively indicated. (6) It is extremely problematic whether, in those cases in which relief was noted, the effect was not due to mental suggestion rather than to any physiologic action of the drug. The neurotic type of individual demanding this treatment will often be relieved by any simple remedy. (7) In those instances in which effects were noted increase in dosage seemed to have little influence in maintaining the effect or preventing the patient from becoming accustomed to its use. (8) In conclusion, the theory which suggests the use of this extract seems to be at fault, and the administration of ovarine or ovarian extract is based upon a wrong assumption as to the function of the ovary. In organotherapy, the best results have been obtained from the use of the thyroid and adrenal glands, and the ovary in function is in no sense analogous to these organs. Its principal function is ovulation, and if any peculiar product is coincidently manufactured, the isolation of this product has not yet been accomplished.

JESSE WILLIAM LAZEAR MEMORIAL.

On the 25th of September, 1900, Jesse William Lazear, at that time Acting-Assistant Surgeon in the United States Army and a member of the Government Commission for the investigation of yellow fever, lost his life from that disease at Quemados, Cuba.

Doctor Lazear was born in Baltimore County, Maryland, in 1866, and graduated from the academic department of the Johns Hopkins University in 1889. In 1892 he received the degree of M. D. from Columbia University. From 1892-95 he spent his time in study and investigation in Europe and as an interne at the Johns Hopkins Hospital in Baltimore. During the following three years and a half, while a member of the staff of the Out-Patient Department of the Johns Hopkins Hospital, he did much valuable work as a teacher and investigator in the laboratory of clinical pathology. In February, 1900, induced by the opportunity for research concerning malarial and yellow fevers, Lazear became an acting assistant surgeon in the United States Army and was assigned special laboratory duties at Columbia Barracks, near Havana. Later, he was appointed member of a special government commission for the investigation of yellow fever. The brilliant discoveries of this commission concerning the ætiology and manner of infection of yellow fever have recently been referred to in public by a distinguished pathologist as the most important piece of work by American students since the discovery of anæsthesia. To these results Lazear, as a member of the commission, contributed largely. The final proof of their discovery that the disease is transferred by the bite of a certain mosquito, could only be obtained by direct experiment upon a human being. To this experiment Lazear, with another of the committee, courageously and heroically subjected himself, and in the performance of this noble duty he lost his life.

The many friends and admirers of the talented and accom-

plished student, of the brave, true, self-sacrificing man, desire to establish a lasting memorial to him and to his work. To this end a meeting was held on the evening of Wednesday, May 22d, which was presided over by Professor William Osler. At this meeting it was concluded that the nature of the memorial could better be decided upon when some idea could be obtained as to the amount of money available. It was, therefore, decided that a committee consisting of Dr. Stewart Paton and Dr. William S. Thayer be appointed to arrange for the distribution of a circular among the friends and admirers of Lazear, setting forth the object of the meeting. It is earnestly hoped that not only those who have known and admired Lazear and his work, but also others, who appreciate courage and manliness and self-sacrifice, may contribute to the fund for the Jesse William Lazear Memorial.

Subscriptions may be sent to Dr. Stewart Paton, Treasurer, 213 West Monument Street, Baltimore, Md. It is to be hoped that the response to this circular may be made early, as it is hoped to be able to decide upon the nature of the memorial by the middle of June.

WILLIAM OSLER, *Chairman.*
STEWART PATON, } *Committee.*
WILLIAM S. THAYER, }

PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

December 17, 1900.

The meeting was called to order by the president, Dr. W. H. Welch.

Dr. Futcher exhibited a case of Rheumatism with Fibroid Nodules.

DISCUSSION.

DR. WELCH.—So far as I am aware, the pathology of these subcutaneous nodules in rheumatism is obscure. Some are so transitory in nature that they are probably attributable to a circumscribed inflammatory œdema; others may persist for weeks and months and are characterized by new formation of connective tissue. It has been suggested that they may be tropho-neuroses. Dr. Cheadle has called attention to the analogies between these nodules and certain fibroid nodules and thickenings of the endocardium in rheumatism. In the only specimen which I have examined the nodule contained dense, fibroid tissue, partly hyaline in character.

The Intrinsic Blood Vessels of the Kidney and their Significance in Nephrotomy. MR. BRÖDEL.

(See page 10, BULLETIN for January, 1901.)

DISCUSSION.

DR. HUNNER.—Dr. Kelly not being present I take the liberty of reporting improved results in his operations for stone since following a definite plan for opening the kidney as outlined by Mr. Brödel.

Formerly he split the kidney, as I suppose most surgeons do to-day, along the line of greatest convexity, thus carrying the incision through the main column of cortical substance, or just that portion as shown by Mr. Brödel's drawings, which should be avoided.

I have begun experimental work upon dog's kidneys to determine the ultimate effect upon the kidney substance of different incisions and different suture materials. In the few operations I have already performed I have been able to demonstrate the value of Mr. Brödel's work as regards hæmorrhage. Cutting through the bases of the pyramids, as determined by the arrangement of the stellate veins of the surface, or in the periphery, by the lobulations, results in decidedly less hæmorrhage than follows splitting the kidney without considering these anatomical points.

DR. WELCH.—Did your investigations extend to the question of anastomosis between the renal vessels and the lumbar and ureteral vessels? It is well known that if one of the branches of the renal arteries be occluded, the area supplied by it dies, with the exception of a small zone of tissue at the base of the infarct just beneath the capsule. This is due to anastomosis with branches from the lumbar arteries.

MR. BRÖDEL.—I found these vessels very frequently but noted nothing different concerning them from what is usually stated in the books.

DR. WELCH.—Did you take up at all the question of origin of the vasa recta?

MR. BRODEL.—I found that these come from the vessels at the base of the pyramids and not from the glomeruli.

DR. WELCH.—I am sure that from many points of view, Mr. Brödel's communication is an important one. I am especially impressed by the number of new gross anatomical points brought out. It shows that gross human anatomy is not thoroughly worked out even yet.

A Case of Arterial Disease, possibly Periarteritis Nodosa. DR. SABIN.

(See page 195.)

January 7, 1901.

The meeting was called to order by the president, Dr. W. H. Welch.

Typhoid Infection without Lesion of the Intestine. A case of Hæmorrhagic Typhoid Fever with Atypical Intestinal Lesions. DR. OPIE and MR. BASSETT.

(See page 198.)

Report upon B. mortiferus. DR. HARRIS.

The history of the case from which this organism was obtained is briefly, as follows: The patient, a white man aged

44, was admitted on the 6th of October to Dr. Halsted's service. His history, both family and personal, was particularly good. Four days previous to his admission he had complained of severe headache which was followed by nausea and vomiting, the latter continuing until his entrance to the hospital. The patient fancied that the vomited material had a fecal odor, and after such spells of nausea he was unable to eat for nearly 24 hours. Two days before coming in, abdominal pain began and remained constant over the whole right side. On being asked to put his hand to the spot of greatest tenderness, he placed it to the right of the umbilicus and in the upper right quadrant of the abdomen. On the day of entry he was seized with a chill and this was followed by profuse sweating. His temperature on admission was 103° with a leucocytosis of 36,000.

On physical examination, liver dullness extended from the 6th rib 8 cm. downwards towards the central line of the abdomen. Upon palpation, the left side of the abdomen was soft and not tender or rigid. There was slight tenderness in the lower right quadrant, but no definite mass could be felt beneath the area of muscle spasm.

His condition became gradually worse, his leucocytosis varying between 7000 and 20,000, and his temperature ranging as high as 105°. On the 9th, Dr. Halsted saw the patient and advised an exploratory operation under cocaine. The condition found was this: the mass below the costal margin was the liver and upon its surface were numerous abscesses with thin walls. During the manipulation of the liver, one of these abscesses ruptured and discharged its contents into the peritoneal cavity. The abdomen was cleaned and the liver packed around with gauze to prevent any further pollution. The patient did not seem to do well, however, after the operation and the symptoms were scarcely improved in any way, though the patient stated that he felt much more comfortable. The dressings were soaked with a discharge of foul odor, the leucocytes continued to rise and later in the evening he had a chill followed by a temperature of 105°. He died on the 13th.

Coverslips made at the time of operation showed many cocci and a few bacilli with pus cells and much debris. The autopsy was performed 5 hours after death by Dr. Opie.

Cultures were made at the autopsy in the ordinary manner on plain agar and left for 48 hours before being examined. At the end of that time it was found that they had become contaminated. I then endeavored to make cultures from the abscesses in the liver. On microscopic examination of coverslips prepared from this pus I was led to believe that I had to deal with an organism that would be rather difficult to cultivate by ordinary means, so cultures were made on hydrocele fluid agar as well as on plain agar, and these were both grown aërobically and anaërobically. Both sets of the aërobic plates were entirely sterile at the end of 48 hours. On the hydrocele plates grown in hydrogen, only one showed growth, and that was the first plate made undiluted from the abscess. The plain agar plate similarly grown was sterile, although the plate showed a great deal of debris from the abscess. The appearance of the successful plate was peculiar; surrounding three minute pieces of necrotic material were zones of very fine colony formation about 8 mm. in diameter. When viewed under the single lens these were shown to be made up of very minute colonies which were transparent and of a slightly yellowish color. Some were irregular, some oval and some round. Coverslips from these showed an organism that corresponded almost exactly with that obtained from the liver abscess material. Upon the whole, it was a very minute bacillary form occurring singly or in pairs; at times the pairs were so small that one could not positively say they were not diplococci; again were seen forms growing in chains resembling streptococci or streptobacilli. Perhaps the morphology of the bacilli from the cultures on the hydrocele fluid agar were slightly larger than those obtained directly. This was not constant, however, for cultures made later showed that the organism could grow quite as small as those found in the abscess. To make sure that I was not dealing with a contamination, cultures were made from individual colonies and it was found that no growth occurred on any media grown aërobically or anaërobically and occurred on the hydrocele agar, only, in the presence of hydrogen. From these latter, plates were again grown to rule out any chance of contamination. It was soon found that the organism would not grow upon any medium that did not contain as a basis, blood, blood-serum, or hydrocele fluid. I was unable to obtain any ascitic fluid with which to work, but it is likely that it would have grown upon that also.

The organism grown in hydrocele fluid agar was able to form gas, but that undoubtedly arose from its action upon muscle sugar. Even when dextrose-free medium was used, there was still some gas-formation. A shake culture in hydrocele-fluid-glucose-agar gave an abundant amount of gas of bad odor, almost fecal. In hydrocele fluid milk there was a slight acidification with doubtful coagulation on the fourth day and a clearing up (" peptonization ") on the 6th day, until the tube became semi-transparent with a thick sediment at the bottom, made up largely of a growth of the organism. On examining very closely a hydrocele fluid bouillon culture, small bubbles of gas were noticed rising to the surface during the first 48 hours. In Dunham's medium, to which hydrocele fluid had been added, the same phenomenon was observed. The organism would not grow on Löffler's ox-blood serum.

Whilst engaged in this cultural work, experimental work was not neglected. A rabbit was inoculated with pus from the same abscess from which I obtained the organism. The animal received .3 cc. intravenously in the afternoon, and was found dead the next morning at 8 a. m. The autopsy showed nothing and cultures were negative. Sections of the tissue examined later, however, showed lesions. Another rabbit was inoculated with .4 cc. of bouillon culture, remained well for two and one-half days and then gradually weakened, became thin, and died on the 6th day. All of the animals inoculated afterwards went through the same course of gradual weakening and emaciation, but ate very well up to the

day of death, which on the average was the 6th day after inoculation. Post-mortem, the lesions of these animals were, generally speaking, emaciation, loss of subcutaneous fat and a tremendous degree of peritonitis; most of them showed a great exudation into the abdominal cavity of bloody fluid, containing much coagulated lymph. The surfaces of the intestines and abdominal organs were coated with a fibrino-purulent material. The spleen, as a rule, was usually more or less completely encased in such a sheath, and in one instance it was found with difficulty. The livers were larger than normal and were found to be studded with yellowish-white round nodules. I was not able to find the fluid contents in these experimental abscesses, as was seen in the liver of the human subject. The consistency of the material in these abscesses was putty-like. In some of the rabbits, abscesses were found in the heart's muscle and in the cerebral hemispheres. In one guinea-pig were found lesions in the lungs quite comparable to those in the human subject, and in one of the rabbits there was a complete infarction of the spleen, due to plugging of the splenic vein.

On looking over the literature one is impressed by the lack of systematic anaërobic investigation, and, with few exceptions, what has been done is without much value. The best of the kind is that carried out by two investigators in Paris, Veillot and Zuber, which will be found, published in 1898, in the Archiv de Médicine Expérimentales. They isolated from a case of gangrene two very small organisms but quite unlike the one I have described. In addition, from 22 cases of appendicitis, they found anaërobic bacilli associated with bacillus coli and streptococcus; in all, I think, they isolated some 7 varieties, and in 2 cases found anaërobes in pure cultures. Likewise, a pupil of theirs, Guillemot, has since written, for his thesis, a paper, which confirms their work on these organisms, and, in addition, he describes three or four more varieties. These in no wise bear any relation to the one described this evening, for they were cultivated upon a medium we all use regularly in our laboratories, glucose-agar, and they grew on all other media, if given anaërobic surroundings; whereas the organism presented to you this evening will not grow so, but requires some such medium as hydrocele fluid, blood or blood-serum, to be added to the ordinary media before growth occurs.

The name proposed for this organism, bacillus mortiferus, is chosen in accordance with the ordinary classification, but, if that of Migula is used, the bacterium mortifer would be more proper.

Discussion.

Dr. Welch.—It is certainly most fortunate that Dr. Harris had from the examination of cover-slips smeared with the fresh material an instinctive feeling, such as will be understood by experienced bacteriologists, that the delicate, unusual bacillus would be difficult to cultivate, and that it occurred to him to inoculate, among other media, tubes containing hydrocele fluid. Dr. Harris has brought conclusive evidence that the organism cultivated is identical with the one found microscopically in the original liver, and that it is responsible for the remarkable lesions of this organ. No especial emphasis need be laid upon the consistence of the pus in the experimental abscesses produced by this bacillus in rabbits, as it is well known that the pus of rabbits usually has a putty-like or cheesy consistence.

Two Cases of Amoebic Dysentery in Children. Dr. Amberg.

(To appear later.)

January 21, 1901.

In the absence of the president, the meeting was called to order by Dr. Kelly.

Exhibition of Surgical Cases. Dr. Mitchell.

Dr. Mitchell exhibited a case where the gasserian ganglion had been excised after the method of Dr. Cushing for a patient who had suffered from facial neuralgia for thirteen years, with the effect to produce complete relief from pain.

The second case was one of operation for typhoid perforation of the intestine, with recovery.

Discussion.

Dr. Futcher.—This case interested us very much clinically, and three or four points in connection with it were of special interest in arriving at the diagnosis of perforation. The child had had a tub at 6 P. M. and had been placed back in bed. At 7.15 she suddenly cried out with intense abdominal pain. A count of the leucocytes was made about this time, on the possibility of some acute complication having taken place, and they were found to be 11,500. The child complained slightly of the pain during the evening but about 11 o'clock when Dr. McCrae was making the late visit in the wards, the patient again cried out with intense pain. He called me and we went over the case together. At that time the abdomen was moderately distended, there was distinct rigidity of the muscles and slight muscle spasm. The liver dullness extended only to a point 3 cm. above the costal margin; before this it had extended quite to the margin of the ribs. The child had a peculiar facial expression, the mouth was rather puckered up and while examining her she suffered spasms of severe abdominal pain which made her cry out. A count of the leucocytes at that time showed that they had fallen to 7000. By 12 o'clock her condition had changed materially. The pulse was weaker, more rapid and of a running character; the abdominal distention was more marked; there was then definite muscle spasm and tenderness in the right iliac fossa on the slightest palpation. There was also appreciable movable dullness in the flanks. There had been practically no change in the temperature. The sudden onset of the pain and its paroxysmal character, the increased frequency in the pulse, the abdominal distention, muscle rigidity and spasm, the diminution in the area of hepatic flatness and the movable abdominal dullness made it reasonably certain that a perforation had occurred. Dr.

Mitchell saw the patient shortly after 12 midnight and agreed that an operation was advisable. The operation was performed about 8 hours after the time at which perforation had occurred.

Healed Amoebic Abscess of the Liver, and Amoebic Abscess of the Lung. Exhibitions of Specimens. DR. OPIE.

The patient was admitted to the hospital March 1, 1900, complaining of pain in the right side and shoulder. He had had dysentery for 13 months but it had disappeared three months before his admission. For about six months he had had pain in the right side and in the right shoulder. When admitted he was emaciated and pale and his skin had a yellowish hue. There was bulging of the lower portion of the right chest below the level of the 5th rib and distention of the abdomen on the right side below the costal margin. The dullness began at the 5th rib in the mammary line, at the 6th rib in the mid-axillary line and at the 8th rib in the line of the angle of the scapula; it extended about 8.5 cm. below the costal margin in the right mammary line. Several exploratory punctures were made but the bloody fluid obtained contained no amœbæ. There was no diarrhœa and amœbæ were not found in the stools.

An operation was performed by Dr. Cushing seven days after admission. The 10th rib was resected in the mid-axillary line and a large abscess cavity entered. It contained about a litre of chocolate-colored fluid in which were necrotic particles. The discharge after the operation was profuse, and in it on the second day actively motile amœbæ were found. The cavity was irrigated with quinine solution varying in strength from 1 to 1000 to 1 to 3000. The discharge gradually diminished in amount and at the end of six weeks had completely disappeared. Amœbæ were frequently found during this period.

On the 5th day after the operation the patient was attacked with cough, which gradually increased in severity and was accompanied by the expectoration of mucopurulent material. At first nothing specific was found in this material but later actively motile amœbæ were discovered. As the cough became worse signs of consolidation appeared over the lower right chest. Eight weeks after the first operation the rib was resected in the anterior axillary line but no abscess cavity was found. A second incision made through the 5th rib at the juncture of the costo-chondral line entered an abscess cavity from which was evacuated a large amount of purulent fluid. The material discharged from this cavity contained numerous amœbæ. On the 4th day after operation occurred a profuse hæmorrhage, with which about a pint and a half of blood was lost. A second hæmorrhage took place eight days later and death followed.

The case was one of dysentery followed by an amœbic abscess of the liver. The dysentery was presumably of the same character though amœbæ were not found in the stools. Following operation the liver abscess healed but death followed the formation of a secondary abscess in the lung.

At autopsy was found in the right lung the large abscess cavity which is well seen in the preserved specimen. The pleura was adherent to the chest wall and the abscess cavity occupied almost the entire anterior half of the middle and lower lobes. The walls are irregular and covered with a soft necrotic material. In the liver, the abscess cavity which two months before death contained a litre of purulent fluid is represented by a small mass of dense fibrous tissue 3 cm. across. In the ascending colon and in the cœcum were numerous pigmented scars, while in the sigmoid flexure were one or two very superficial ulcers. In the contents of the lung cavity were numerous motile amœbæ. None could be found in material scraped from the intestinal ulcers, though it can be hardly doubted that amœbæ were present during the active stage of the dysentery.

The etiological relationship of amœbæ to so-called amœbic dysentery is not entirely undisputed. The presence of amœbæ in the walls of abscesses in organs distant from the infected intestines furnishes the best evidence of their pathogenicity. The amœbæ are constantly associated with one form of dysentery characterized by the occurrence in the large intestine of a lesion whose distinctive feature is necrosis and softening of the submucous tissue with the production of irregular ulcers with undermined edges. That they are the causal factors in the production of the disease has been questioned since on the one hand a variety of bacteria are always present and on the other hand similar amœbæ have been found by Cunningham, Grassi, Schuberg and others in the stools of healthy individuals and of those suffering with other diarrhœal diseases.

Belief in the pathogenicity of the Amœba coli is justified by certain facts: (1) Amœbæ are constantly associated with a form of dysentery which is characterized by peculiar anatomical lesions; they occur within the lesions and in the discharges from them. (2) They are found in abscesses of the liver and of the lung accompanying this form of dysentery but are not found in other abscesses of these organs. (3) Though the anatomical picture of chronic tropical dysentery has not been reproduced in animals, an inflammatory condition of the large intestine accompanied by multiplication of the organism in the lumen of the intestine and in the affected tissue has been produced (Kruse and Pasquale) by injecting into the rectum of cats purulent material from liver abscess containing only amœbæ. The injection of non-dysenteric fæcal material containing amœbæ has not caused a similar condition.

Exhibition of a Case of Osteoma of External Auditory Canal. DR. RANDOLPH.

It is seldom we have the opportunity of seeing new growths in the external auditory canal. The most common one is an osteoma, which occurs either as a localized exostosis or as a more diffuse hyperostosis, the etiology of which is rather obscure. Buck, of New York, thinks that they are often due to the irritation produced by a chronic discharge. I doubt very much whether this is the true interpretation of it. We know how frequently otorrhœa is seen and how seldom we meet with an exostosis.

The treatment does not call for aggressive measures except in a very limited number of cases. If the patient is quite deaf in one ear and an osteoma is interfering with the better ear, then an operation should be undertaken. Or if there is a discharge from that ear the tumor should be removed lest its growth should close the orifice and cause serious symptoms. Otherwise the tumor is allowed to stay. When it completely fills the canal its development seems to come to a standstill and it gives no further trouble than to interfere with hearing. The great trouble about operative measures in these cases is that it is very difficult to remove the tumor without running some risk of producing inflammation which may extend to the drum membrane and produce a more serious condition. Last year I made mention, in my report in "Progressive Medicine," of the only other case I have seen and upon which I operated successfully. The man was quite deaf in one ear and the osteoma was attached to the superior wall, and apparently filled the whole external auditory canal nearly to the drum membrane. I perforated the growth by applying to it nitrate of silver fused on the end of a probe and applying it at long intervals until I had gotten clean through the growth. It produced such a disturbance in the nutrition of the growth that it was easily broken down and in 3 months' time the canal was entirely clear. This seems a long and rather tedious treatment to adopt but it was attended with no irritative symptoms and was followed with complete success.

This boy's osteoma fills up the canal entirely but I have not suggested any operation here, because it does not seem to be called for.

Suspension of the Kidney. An Extensive Vesico-Vaginal Fistula. DR. KELLY.

(To appear later.)

February 4, 1901.

Exhibition of Medical Cases. Chronic Jaundice with Xanthoma Multiplex. DR. OSLER.

The patient, aged 39, had typhoid fever with cholelithiasis in 1897 and has had three attacks of biliary colic (the first in December, 1899), characterized by pain, vomiting, chills, fever, sweats and jaundice, and following each attack the jaundice has deepened. The form of jaundice is that associated with stone in the common duct, that is to say, intermittent in character and deepening after the attacks of colic, etc. The unusual complication is the presence of what is known as Xanthoma multiplex.

All of you have noticed, especially in brunettes, a distinct little tumor on the eyelids, sometimes on both but usually on the lower lid, the common Xanthelasma palpebrarum. In a few rare instances these remarkable tumors are widely distributed over the body, usually in connection with chronic jaundice. Oddly enough Dr. Sabin a day or two ago met another patient with the same condition in chronic jaundice.

In a few rare instances multiple Xanthelomata have occurred in young persons without jaundice. Not only do the tumors occur in the skin but in a few cases in the mucous membranes, on the serous surfaces and in the bile passages, the gall-duct and gall-bladder. In this patient the distribution is on the hands, elbows, axillæ, neck and on the toes; they are chiefly in the folds and at points of irritation.

The yellow color is due to the presence of supposed characteristic cells sometimes spoken of Xantheloma cells, which undergo a fatty degeneration and the color is due to the fat. Occasionally these tumors undergo complete involution and thus disappear. This patient will have an operation performed for removal of the gall-stone and it is to be hoped the tumors will disappear, but in any case they are never serious, do not grow very large and are a source of annoyance only through the slight disfigurement produced. She has one patch on the mucous membrane of the upper lip but there are only a few small ones about the eyelids.

DISCUSSION.

DR. WELCH.—I hope that a careful histological study will be made of specimens of the xanthomatous lesions in this case, as the subject is one offering many unsolved problems. My attention was directed a few years ago to Xanthoma through the opportunity of examining sections sent to me by Dr. Pollitzer of New York, whose specimens were utilized by Unna in his description of generalized Xanthoma. The specimens which I examined were of ordinary Xanthoma palpebrarum. There appear to be at least three, and probably more, clinical types of disease which have been called Xanthelasma or Xanthoma, namely, Xanthoma vulgare of the eyelids, an extremely common and unimportant affection, juvenile Xanthoma multiplex, and genalized Xanthoma of adults, most frequently secondary to jaundice and diabetes mellitus, but occurring also without any apparent cause. Unna makes a sharp histological difference between the common form of palpebral Xanthoma and generalized Xanthoma. According to him, in the former the fat, which gives the yellow color to the lesion, is of a peculiar character and lies in extracellular masses within the lymphatic spaces and vessels, there being no true Xanthoma cells. I am not aware that Unna's views, which are not in accordance with those usually accepted, have been confirmed. Waldeyer in his first publication and most other investigators following him find the fat in small granules or droplets within large cells believed to be derived from connective-tissue cells or endothelial cells, these fatty cells being the so-called Xanthoma cells. Later Waldeyer suggested that these cells may come from his plasma cells or Toldt's embryonic fat-forming cells, and this view has had a number of advocates. Dr. Pollitzer finds evidence in his sections of palpebral Xanthoma that the characteristic cells containing fat are derived from striped muscle, partly displaced through congenital abnormality into the corium. Virchow objects to the designation "Xanthelasma" or "Xanthoma," as not based upon histological characters, and has proposed, as a substitute, fibroma lipomatodes, but this suggestion seems to have met with little success. There is a

rare form of lipoma which bears considerable anatomical resemblance to certain of the larger neoplasms which have been described as Xanthomata. I examined such a specimen some years ago. It was a lobulated and encapsulated subcutaneous tumor, the size of a hen's egg, removed from the groin of a young man, and believed at the operation to be an ordinary lipoma. On section it presented a uniform, yellow surface, and microscopically it was composed entirely of vascular stroma and large cells filled with minute granules or droplets of fat. After removal of the fat single, or occasionally multiple, round or oval nuclei with nucleoli were found usually about the middle of cells filled with a finely porous or reticulated protoplasm. There was a stroma around individual cells or groups of cells. I interpreted the tumor as composed of embryonic adipose tissue. There were no adult adipose-tissue cells with single, large oil-drops. I mention this tumor on account of its histological resemblance to certain xanthomatous tumors, but otherwise it has no relation to Xanthoma, as it was the only new growth and was in the subcutaneous tissue. It is highly probable that a variety of distinct affections have been described under the name of Xanthoma.

A Case of Arsenical Neuritis. DR. SABIN.

The patient is a young woman who was brought to the hospital two months ago, November 23, 1900, after having taken about a dram of Rough on Rats. She came in a few hours later saying she had felt well for two hours after taking the poison but had then begun to vomit. Her stomach was washed out repeatedly and large doses of the antidote given, together with epsom salts and castor oil. The only troublesome symptoms she exhibited while in the hospital were nausea and vomiting. She was dismissed in five days feeling well, but noted that on walking up the steps of her home her feet were numb and the steps felt soft. She was soon able to be up and about but the numbness of the feet never left her. On January 1 she had an attack of painful micturition that was followed by fever lasting six days. The numbness of the feet gradually increased and she became unable to walk.

When she came to the hospital again she had double foot-drop and wrist-drop, the muscles involved, however, were not entirely paralyzed. Her hands were so weak that she could not feed herself. Electrical reaction was given only with strong currents. There was delayed sensation over the legs and arms, and slight impairment in the fingers and toes but no complete anæsthesia. There was hyperæsthesia of the soles of the feet so that the slightest touch caused pain and muscle spasm. When she came in there was some keratosis over the soles of the feet. The palms of the hands were not thickened but since admission some keratosis has developed. The skin is everywhere dry and scaly. On both hands there is a white line running transversely across each nail. The skin reflexes are increased, the deep reflexes absent.

DISCUSSION.

DR. OSLER.—It is interesting that neuritis seen in general practice occurs in persons who have taken a considerable quantity of arsenic at one time and not in those who take a large quantity over a prolonged period. Arsenic is one of the medicines most commonly used, and yet we rarely see a neuritis following it. We have had but one case before in the hospital and that patient took one ounce and two drachms of Fowler's solution. There has been in the city a case (seen by Dr. Carey Gamble in consultation) of fatal neuritis following the use of arsenic for chorea. Arsenic is a drug that may be taken in considerable doses for long periods without any damage whatever, and the cases of neuritis that do occur are probably in patients who have an idiosyncrasy for it. Hutchinson reports a case of a man who had taken arsenic nearly all of his life and without showing even pigmentation.

A Case of Pemphigus Vegetans. DR. HAMBURGER.

(To appear, with discussion, later.)

The Frequency of Typhoid Bacilli in the Blood. DR. COLE.

(See page 203.)

SUMMARIES OR TITLES OF PAPERS BY MEMBERS OF THE HOSPITAL AND MEDICAL SCHOOL STAFF APPEARING ELSEWHERE THAN IN THE BULLETIN.

CHARLES RUSSELL BARDEEN, M. D. The Function of the Brain in Planaria Maculata.—*American Journal of Physiology*, Vol. V, No. 3.

——— and ARTHUR WELLS ELTING, M. D. A Statistical Study of Variations in the Formation and Position of the Lumbo-sacral Plexus in Man.—*Anatomischer Anzeiger*, Bd. 19, Nos. 5-6.

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——— The So-called Cardiac Neuroses: Classification; Etiology; Pathology.—*Chicago Medical Recorder*, May, 1901.

E. BATES BLOCK, M. D. Enchondroma-like Formations in the Femur, following Osteomyelitis.—*Journal of Pathology and Bacteriology*, February, 1901.

JOSEPH C. BLOODGOOD, M. D. Blood Examinations as an Aid to Surgical Diagnosis.—*American Medicine*, May 18, 1901.

THOMAS R. BROWN, M. D. A Review of Some of the Recent Work on the Physiology and Pathology of the Blood.—*Maryland Medical Journal*, December, 1900; February, March, April, May, 1901.

——— The Prospect in the Treatment of Lobar Pneumonia.—*Maryland Medical Journal*, January, 1901.

——— Urinary Hyperacidity: A Consideration of Cases with Symptoms Suggestive of Cystitis, but with no Infection, Due to this Cause.—*Philadelphia Medical Journal*, March 2, 1901.

——— Notes on the Blood and Vesicle Cells in Dr. Smith's Case of Epidermolysis Bullosa.—*Maryland Medical Journal*, April, 1901.

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——— and BRUCE W. GOLDSBOROUGH, M. D. A Rare Form of Extrauterine Pregnancy.—*American Medicine*, April 6, 1901.

——— Sur la Laparotomie Exploratrice Précoce dans la Perforation Intestinale au Cours de la Fièvre Typhoïde.—*Archives Générales de Médecine*, January, 1901.

SIMON FLEXNER, M. D. Experimental Pancreatitis.—*University Medical Magazine*, January, 1901.

——— Etiology of Dysentery.—*The Journal of the American Medical Association*, January 5, 1901.

——— The Etiology of Tropical Dysentery.—*Centralblatt für Bakteriologie*, Erste Abt., Bd. 28, No. 19.

WILLIAM W. FORD, M. D. Variation of the Properties of the Colon Bacillus, Isolated from Man.—*Journal of the Boston Society of Medical Sciences*, January 15, 1901.

——— Obstructive Biliary Cirrhosis.—*American Journal of the Medical Sciences*, January, 1901.

——— On the Bacteriology of Normal Organs.—*The Journal of Hygiene*, Vol. I, No. 2.

THOMAS B. FUTCHER, M. D. Syphilitic Fever, with a Report of Three Cases. (From the Service of Professor William Osler.)—*New York Medical Journal*, June 22, 1901.

NORMAN B. GWYN, M. D. The Disinfection of Infected Typhoid Urines.—*Proceedings of the Phila. County Medical Society*, Vol. XXI, No. 7; *Philadelphia Medical Journal*, January 12, 1901.

NORMAN HARRIS, M. D. A Preliminary Report upon a Hitherto Undescribed Pathogenic Anaërobic Bacillus.—*Journal of the Boston Society of Medical Sciences*, February 19, 1901.

ROSS GRANVILLE HARRISON, M. D. Ueber die Histogenese des peripheren Nervensystems bei Salmo salar.—*Archiv für Mikroskopische Anatomie*, Bd. 57, Heft 2.

ALBION WALTER HEWLETT, M. D. The Superficial Glands of the Oesophagus.—*The Journal of Experimental Medicine*, Vol. V, No. 4.

HENRY BARTON JACOBS, M. D. A Short Account of the Recent International Medical Congress in Paris.—*The Boston Medical and Surgical Journal*, January 10, 1901.

——— Four Cases of Sporadic Cretinism.—*Maryland Medical Journal*, March, 1901.

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G. BROWN MILLER, M. D. The Streptococcus Pyogenes in Gynecologic Diseases.—*Journal of the American Medical Association*, May 18, 1901.

M. ADELAIDE NUTTING. The Preliminary Education of Nurses.—*The American Journal of Nursing*, March, 1901.

EUGENE L. OPIE, M. D. The Relation of Cholelithiasis to Disease of the Pancreas and to Fat Necrosis.—*American Journal of the Medical Sciences*, January, 1901.

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WILLIAM OSLER, M. D. On Perforation and Perforative Peritonitis in Typhoid Fever.—*Proceedings of the Philadelphia County Medical Society*, January, 1901, and *Philadelphia Medical Journal*, January 19, 1901.

—— A Plea for the More Careful Study of the Symptoms of Perforation in Typhoid Fever with a View to Early Operation.—*The Lancet*, February 9, 1901.

—— The Medical Aspects of Carcinoma of the Breast, with a Note on the Spontaneous Disappearance of Secondary Growths.—*American Medicine*, April 6 and 13, 1901.

—— Hemorrhage in Chronic Jaundice.—*American Medicine*, April 27, 1901.

—— The Study of Internal Medicine.—*Medical News*, April 27, 1901.

—— The Natural Method of Teaching the Subject of Medicine.—*The Journal of the American Medical Association*, June 15, 1901.

LINDSAY PETERS, M. D. Resection of the Pendulous, Fat Abdominal Wall in Cases of Extreme Obesity.—*Annals of Surgery*, March, 1901.

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B. R. SCHENCK, M. D. Four Cases of Calculi Impacted in the Ureter. Nephro-Ureterectomy, Abdominal Uretero-Lithotomy, Vaginal Uretero-Lithotomy.—*Journal of the American Medical Association*, May 11, 1901.

WALTER R. STEINER, M. D. Dermatomyosites, with Report of a Case which also Presented a Rare Muscle Anomaly, but Once Described in Man. (Abstract.)—*Journal of the Boston Society of Medical Sciences*, February 19, 1901.

SAMUEL THEOBALD, M. D. The Evolution of the Ophthalmoscope and what it has done for Medicine.—*New York Medical Journal*, June 22, 1901.

GEORGE WALKER, M. D. Curetting the Urethra in the Treatment of Chronic Posterior Urethritis.—*Maryland Medical Journal*, March, 1901.

—— Tuberculosis of the Vesiculae Seminales, Testes and Prostate; Complete Excision of Right Side; Incision and Curetting on Left Side: Cured.—*Maryland Medical Journal*, February, 1901.

WILLIAM H. WELCH, M. D. Distribution of Bacillus Aerogenes Capsulatus. (Bacillus Welchi, Migula.)—*Journal of the Boston Society of Medical Sciences*, February 19, 1901.

HUGH H. YOUNG, M. D. An Operating Table for Office Work.—*Maryland Medical Journal*, March, 1901.

—— Ueber ein neues Verfahren zur Exstirpation der Samenblasen und der Vasa deferentia, nebst Bericht über zwei Fälle.—*Archiv für klinische Chirurgie*, Bd. 62, Heft 3.

NOTES ON NEW BOOKS.

Golden Rules of Surgical Practice. By E. HURRY FENWICK, F. R. C. S. Golden Rules Series, No. I. Fifth edition. Revised and enlarged. (*Bristol: John Wright & Co.*)

Golden Rules of Obstetric Practice. By W. E. FOTHERGILL, M. A., B. Sc., M. D. Golden Rules Series, No. III. (*Bristol: John Wright & Co.*)

Golden Rules of Physiology. By I. WALKER HALE, M. B., Ch. B. (Viet.), and J. ACWORTH MENZIES, M. D., C. M. (Ed.). Golden Rules Series, No. VI. (*Bristol: John Wright & Co.*)

Golden Rules of Ophthalmic Practice. By GUSTAVUS HARTRIDGE, F. R. C. S. Golden Rules Series, No. VII. (*Bristol: John Wright & Co.*)

These little books have been published to aid students in preparing for examinations, and, as one would naturally suppose, they combine a maximum of information with a minimum of space. Their size in fact suggests that they are intended to be pocket-guides and private lights until the shoals and reefs of an examination are safely passed. If guides are required in cramming for an examination, these seem to be exceptionally well written and printed, and can be commended.

Essentials of Histology. By LOUIS LEROY, M. D. 72 illustrations. (*Philadelphia: W. B. Saunders & Co., 1900.*) Price, $1.

This small volume is a quiz compend with very diagrammatic illustrations. It may afford solace to those contending against the rigor of State Board examinations; but to the sincere student of anatomy it is of little interest.

A Text-Book upon the Pathogenic Bacteria, for Students of Medicine and Physicians. By JOSEPH MCFARLAND, M. D. Third edition. (*Philadelphia: W. B. Saunders & Co., 1900.*)

The second edition of this work was reviewed in the Bulletin of December, 1898.

We ask the attention of our readers to the vast improvement made in this, the third edition, compared with that of its pre-

decessors; inaccuracies have been corrected, chapters carefully rewritten, and much new and valuable material introduced.

Especially to be commended are the chapters upon Infection and Immunity, which are made to embrace the latest views of the various well-known authorities in these speculative fields of research; the articles upon Tuberculosis, Diphtheria, Typhoid Fever and Plague; whilst the chapters dealing with general technique have undergone satisfactory revision.

Dr. McFarland is to be congratulated upon the excellent merit of this volume. N. MacL. H.

An American Text-book of Physiology. Edited by WILLIAM M. HOWELL, Ph. D., M. D. Second edition, revised. Vol. II. (*Philadelphia: W. B. Saunders & Co., 1901.*)

The second edition of the American Text-book of Physiology, edited by Professor Howell, has recently been completed by the appearance of its second volume. The first volume of this edition was placed before the public some time ago and was reviewed in the February number of the BULLETIN. Most of the opinions there expressed relating to the value of the work in general might be repeated here, but such a repetition is considered unnecessary.

The second volume treats of the general physiology of muscle and nerve, the central nervous system, the special senses, of special muscular mechanisms, and of reproduction. The authors who contributed to the first edition have rewritten their respective subjects for this volume.

Professor Lombard's article on the general physiology of muscle and nerve contains very much valuable knowledge, knowledge that is especially interesting to the advanced student in physiology. This is probably explained in part by the fact that a very large amount of detail is introduced. But it is just this that detracts, to some extent, from its value to the beginner. In the treatment of such subjects as the spread of electrostatic charges, the effect of temperature upon the irritability of nerve and muscle, contraction in normal muscle following frequent excitation, etc., the detail is almost sufficient to overwhelm the average student. At the same time the brevity that the character of the article necessitates leads to an inevitable lack of clearness. The brief and incomplete reference to v. Furth's work on the proteids of muscle will convey to the student but a vague idea of its meaning in the chemical and physiological processes of muscle. On the other hand it is noticeable that the article has been carefully brought up to date. Practically all of the recent important work receives notice. The rather vague statement of the neuron theory in the first edition gives place to a clear and definite exposition in the present volume. The additions to our knowledge of the physiological processes in muscle made through physical chemistry are referred to. The work of Bottazzi, Bonettan, Budgett, v. Furth, and many others has been incorporated in the text. In this connection we must say that Lombard has added an interpretation to the work of Budgett and Green which these authors do not mention. Lombard is discussing the question, do nerve fibres conduct the impulse in both directions from the point of stimulation? It will be remembered that Budgett and Green cut the pneumogastric nerve between the ganglion and the cranium, and then sutured its peripheral cut end to the peripheral cut end of the hypoglossal. Three months after operation stimulation of the central end of the vagus caused the muscles of the tongue to contract. ". . . There would seem to be no escape from the conclusion that the sensory fibres of the pneumogastric had conducted the impulse centripetally as far as the ganglion and then centrifugally down to the muscles of the tongue." This is true, but in so doing the nerve fibres were conducting in the direction in which they normally conduct—first to the nerve cell, then from the nerve cell. At no time was the impulse carried in a direction opposite to its normal one. The experiment does not demonstrate the power of nerve fibres to conduct in both directions.

The article on the central nervous system by Professor Donaldson has been rearranged and largely rewritten so as to render this subject more "suitable to the needs of students and practitioners." In a brief introduction generalizations are expressed with a degree of simplicity and clearness that is charming. As a general rule these attractive qualities of style are maintained throughout the article. It is to be regretted that the author has permitted to appear in the text his categorical descriptions of the cranial nerves. It is true that the student is referred to Barker's work on the nervous system for more complete descriptions; still the insertion of a diagram, especially of the cochlear nerve, or a more definite statement of the relations of the various parts, might have made such reference unnecessary. We believe that some improvement could still be made in the way of rendering the work more useful to medical students. Thus the treatment of aphasia, a subject of considerable interest in itself and besides of some clinical importance, is rather brief, while to the growth of the brain probably more space is devoted than its importance to the medical student calls for. The subject is carefully brought up to date by the addition of most of the recent work, such as that of Nissl and Marinesco. A large amount of material has been drawn from Barker's compendium, "The Nervous System and its Constituent Neurones."

Professor Bowditch's article on the sense of vision is practically unchanged. The only real additions made are included in the two paragraphs which embody the views of Müller on color perception and Einthovin's explanation of the illusion of space-perception. The author takes advantage of the new edition to insert many references that were omitted in the first edition. These might be still further improved by the addition of dates. As far as style, appropriate selection, and coordinate treatment are concerned, there is nothing that could be wished for.

The articles on the remainder of the "special senses," in which are apparently included the senses of hunger, thirst and equilibrium, are contributed by Professor Sewall. With the exception of slight alterations in the articles on hearing, cutaneous and muscular sensations and equilibrium necessary to bring them up to date, these articles stand as they were in the first edition. The anatomical expositions are excellent, the style clear, and the subject-matter as complete as the limitations of a text-book permit.

The fact that under the physiology of the "Special Muscular Mechanisms" only the physiology of locomotion and of the voice and speech are developed, might influence the beginner into believing that these are the only special muscular mechanisms. A brief reference to the special mechanisms treated in other parts of the work might have freed it from this ambiguity. The articles under this head by Lombard and Sewall call for no special comment.

The fascinating article of Lee on reproduction has been kept up to its original high plane by the addition of the recent literature. Thus Schenk's views on the determination of sex receive an appropriate notice, and Arrhenius' interesting suggestion that the rhythmicity of menstruation might possibly be dependent upon synchronous variations in atmospheric electricity is referred to. A few loose statements from the first edition have crept into the second, *e. g.*, "the thickness of the spermatozoan is .055 mm.," "the number of chromosomes in the chromatin," "the most abundant of the solid chemical constituents of the spermatozoan is nuclein, probably in the form of nucleic acid."

So much for the text-book so far as the individual contributors are concerned. The advantages and disadvantages of a text-book written by a number of authors are obvious and have been fully and frequently discussed. The advantages in this special case have been well brought out in the review of the first volume of this text-book above referred to. One of the disadvantages (arrangement) was also then mentioned. Beside disadvantageous arrangement, omission is quite apt to occur. Every attempt has apparently been made to guard against this in the work under consideration. The only omission of any importance that the reviewer has discovered is a treatment of the knee-jerk phenomenon. Donaldson, in speaking of nervous background, mentions reinforcement of the knee-jerk, apparently taking it for granted that this subject has been treated by Lombard. Lombard, however, says nothing about it, probably believing that it does not come within his sphere. The text-book is thus minus a discussion of this important phenomenon, which is so much the more to be regretted when we recall the fact that one of the contributors (Lombard) has devoted so much of his time to the investigation of this very point.

It is to be distinctly understood that the unfavorable criticisms herein mentioned involve only minor points which may be found in every text-book if looked for. Indeed one is struck by their relative infrequency in the book under discussion. And after a thorough perusal of the American Text-book of Physiology the reviewer believes, as has been stated by another elsewhere, that "on the whole this work is certainly the best text-book of physiology for medical students in the English language, and it will doubtless continue to be used generally in all medical schools of the first class." J. E.

A Medico-Legal Manual. By WILLIAM W. KEYSER, Lecturer on Medical Jurisprudence and Judge of the District Court, Omaha. (*Omaha: Burkley Printing Co., 1901.*)

This excellent little book has been written by the author for the benefit of physicians and aims to present the legal side of medical jurisprudence. It gives legal terms and principles with the laudable purpose of preparing the medical man to acquit himself creditably as an expert witness.

The author takes a most sensible view of the vexed question of expert testimony. He says: "Much of the odium heaped on opinion-evidence is chargeable to present methods of selecting expert witnesses. Each side calls only those whose opinions are preascertained and favorable. The witnesses are biased by a desire for victory for the side which enlists them, particularly so if the opposing experts are members of other schools of practice. Justice is thwarted, advance in medical science is retarded and the profession is disgraced. It is not the province of this work to advocate any particular method of procuring expert testimony; but it is proper to urge the professions of law and medicine to extricate this valuable branch of evidence from its humiliating situation. Expert witnesses should be called by the State or by the trial judges, not as friends or supporters of either side, but as advisers of the court. Their fees should be paid out of a general fund and should not depend on the result of the case. Indeed, so far as may be, they should occupy a position as independent and impartial as that of the judge or jury."

The chapter entitled "The Doctor as a Witness" is eminently clear, practical and marked by good sense. It should be read by every young physician.

The book as a whole is worthy of all praise. It is a manual and not an exhaustive treatise, and cannot supersede the classical works on jurisprudence.

Golden Rules of Skin Practice. By DAVID WALSH, M. D., Edinburgh. Golden Rule Series, No. VIII. pp. 102. (*Bristol: John Wright & Co., 1900.*)

A tersely written and convenient little manual for the treatment of diseases of the skin. The directions given for the use of remedies are sensible and judicious.

Urinary Diagnosis and Treatment. By J. W. WAINWRIGHT, M. D. (*Chicago: G. P. Engelhard & Co., 1900.*)

In this small work of 134 pages, the author attempts to give the simplest methods of urine examination with the most recent ideas concerning the treatment of urinary disorders. As he states that he wishes to avoid the more or less elaborate accounts of larger books, it is probably not proper to offer any criticism as to his descriptions except on one important point, namely, clearness. The shorter such things are made the more necessity for the absence of any doubt as to what is meant. For example, the writer lays much stress on the recognition of the number and kind of casts, and yet his description of them is at times even puzzling. Thus one might have some difficulty in knowing what was meant by this: "If the epithelium be attached to the tube and is discharged alone and after the epithelial cast, we have the *hyaline casts.*"

The busy general practitioner, for whom the work is intended, would be better to consult a more elaborate manual for his urinary work. The prescriptions, formulæ of solutions and tables along with the plates, which are from Hoffman and Ultzmann, will all be found useful. These, with the occasional notes on treatment, are the best features of the book.

The American Year-book of Medicine and Surgery for 1901. In two volumes. Vol. I. General Medicine. Vol. II. General Surgery. (*Philadelphia and London: W. B. Saunders & Co., 1901.*)

The division of this work into two volumes, which was begun last year, has proved so satisfactory that it is continued. The smaller volumes are much more easily handled. There is little to be said of the Year-book except to repeat our previous commendation of it. It has been found most useful and reliable. When one considers the possibility of error in the handling of so many references, the care taken in the preparation of the articles must be evident. The Year-book is worthy of the support of the profession. Dr. Gould and his contributors are to be congratulated on the volumes for this year.

The Tale of a Field Hospital. By FREDERICK TREVES. (*London and New York: Cassell & Co., 1900.*)

We have long known with what a graphic pen Mr. Treves can write of disease and its manifestations. He has shown in the present work that he can equally well describe places and events. This is a small volume, very neatly gotten up and illustrated by excellent photographs. It gives the account of the field hospital with Buller's force, with which Mr. Treves was connected. The chapters show the clear-cut description which has been such a feature of the recent work of war-correspondents. The text is not specially professional in tone, there are no technical descriptions, and yet throughout one feels that the eyes by the help of which we see are those of one of our own profession.

It is impossible to quote much of the contents. The sombre note must predominate in the account of a field-hospital. Perhaps the chapter on "The Two White Lights" is the best example of this. The situation of the hospital was marked at night by two white lights on a flagstaff, and one can imagine what the sight of them meant to the wounded who were being brought in. The query of the wounded man in the bottom of

the ambulance sums it up: "Don't you see nothing yet, Bill, of the two white lights?" The other side is not lacking, as is shown in the chapter on "The Body-snatchers." This name was given to a volunteer ambulance corps of two thousand men recruited from everywhere but who seem to have done excellent service. They became the butt of many jokes and were known as "body-snatchers," "catch-em-alive-ohs" or the "pick-me-ups." The constant habit of the "tommies" is to turn everything into a jest.

Mr. Treves has paid close attention to the feelings and sentiments of the common soldiers. He bears testimony everywhere to his courage and patient endurance. Little is said in reference to the hospital management, yet one gathers that the author considers the best possible to have been done.

The Medical Annual. A Year-book of Treatment and Practitioner's Index. (*1901. Bristol: John Wright & Co.; New York: E. B. Treat & Co.; Toronto: J. A. Caweth & Co.*)

This is the nineteenth year of this annual and the standard of previous years is well kept up in the present volume. There are now seven contributors from this side of the Atlantic. The title explains the purpose of the book. It is divided into sections, of which the first deals with the new remedies of the year. The author in his introduction alludes to the decline in the art of prescribing and quotes the remark that "with some practitioners the atrophy of disuse has almost blighted their capacity to think out and indite a good prescription." We would rather suppose that in many of the younger generation such a capacity has never existed. There is a good article on toxins and antitoxins in this section. By far the greater part of the book is taken up with the discussion of new treatment. Subjects are taken up alphabetically, the principal articles on the subject are extracted and the list of references given. It is impossible to review such numerous articles, but those on the digestive system and heart seem especially good. Throughout, however, the work has been well done. The third section includes sanitary science, recent legal decisions of interest in medicine, a review of new inventions and appliances, and a list of the new books of the year, medical journals, etc. This volume can be recommended as previous ones to be of much use, especially to the busy practitioner.

Tropical Diseases. A Manual of the Diseases of Warm Climates. By PATRICK MANSON, M. D., LL. D. (*London and New York: Cassell & Co., 1900.*)

This is a revised edition of this work, which has now grown to nearly 700 pages. The small size renders it very convenient for carrying, a point kept in view in the preparation of the volume. The book opens with the consideration of malaria, to which considerable space is given. The part played by the mosquito is fully described and illustrated by diagrams. The discussion of the disease is thorough as might have been expected. The section on hæmoglobinuric fever is especially interesting. Yellow fever, Bubonic plague and various rarer diseases are next considered. The account of beriberi is given in a graphic way, and the description of the disease is excellent. In taking up dysentery, Dr. Manson points to the probability of what has more recently been practically established in regard to the various factors in the causation of the disease. Abscess of the liver is discussed at some length. Perhaps the most interesting section is that on animal parasites and associated diseases. Regarding filiarisis especially, Dr. Manson is well qualified to speak, and this is a most valuable portion of the work.

There are few works on medicine that can be read with more pleasure in addition to profit than this one. One reads not only for the interest of the subject, but also for the style of the writing. It is to be regretted that this is not a characteristic of more medical works.

A Pilgrimage; or the Sunshine and Shadows of the Physician. By WM. LANE LOWDER, B. S., M. D. (*Louisville, Ky.: R. H. Carothers.*)

This little volume is the outgrowth of a series of essays read before several county medical societies in Kentucky. The intention of the book is to dignify and ennoble the profession of medicine. The sentiments contained in it are unexceptionable but commonplace. They are enforced by trite quotations from familiar poets, living and dead. The following from the first page will serve as an example of the one hundred and ninety pages which follow:

"The career of the physician begins with his determination to study medicine and terminates with his death; or, as is so beautifully portrayed by the immortal Gray in that matchless poem 'The Rude Forefathers of the Hamlet,' when

> 'The breezy call of incense breathing morn,
> The swallows twittering from the straw-built shed,
> The cocks shrill clarion or the echoing horn
> No more shall rouse them from their lowly bed.'

Then it is, and not till then, that his labors cease and his trials are all ended. The morning of this life should be commenced with aseptic hands and a sterilized heart, that the ambition to realize the ideal in a profession, honored in all ages by all men, will not be infected by skepticism or greed."

If one has time to read these excellent but thread-bare sentiments he will surely receive no damage. The question, however, obtrudes itself whether it is worth while for the author to spend "the dark and silent hours of the night—hours stolen from sleep; hours usually allotted to the repose of body and mind"—in writing them, as we are assured he has. The purpose of the book is good.

Nursing Ethics for Hospital and Private Use. By ISABEL HAMPTON ROBB. (*Cleveland: J. B. Savage, 90-92 Wood Street, 1901.*)

While books on the subject of nursing are rapidly increasing in number and variety, this is the first attempt in this country, so far as we know, to deal with this subject from any but the practical and technical standpoint. In the twelve chapters of which the book is composed we find first the subject of nursing as a profession thoroughly discussed, and supplemented by a careful consideration of what should constitute the qualifications of those who desire to enter it. The duties of the nurse as a pupil and as an officer in every condition of hospital life follow; and her relation to the public generally is treated exhaustively in the later chapters, the two last taking up the subject of private duty in a clear, comprehensive and satisfactory manner. The book is in fact a treatise on the whole duty of the nurse, and while we cannot follow in detail the handling of the many points brought forward, we can recommend the book as valuable and suggestive, not only to the individual nurse, but to superintendents and teachers in training schools as a medium for systematic instruction. In view of the fact that nursing is preeminently one of those occupations in which professional skill should always be supported by personal attributes of a very high and definite order, it might seem surprising that this book is the first of its kind were it not from the fact that it is generally believed that these qualities are inborn and the principles which underlie them cannot be taught through the medium of books. In the training of character, however, which is one of the foremost objects of all modern education, one gladly recognizes as the most helpful agencies much which is out of the beaten track of definite instruction, practical or theoretical, and which helps by guiding and suggesting.

Whatever the author writes about nursing must be accepted as the work of one thoroughly conversant with every aspect of her subject, and as the subject itself is one which occupies a fair share of public attention, the book must have a wide influence.

Diseases of the Tongue. By HENRY T. BUTLIN, F. R. C. S., D. C. L., Surgeon to St. Bartholomew's Hospital, formerly Erasmus Wilson Professor of Pathology and Hunterian Professor of Surgery at the Royal College of Surgeons; and WALTER G. SPENCER, M. S. M. B. (Lond.), F. R. C. S., Surgeon to the Westminster Hospital and in charge of the department of diseases of the nose and throat, formerly Erasmus Wilson Professor of Pathology at the Royal College of Surgeons. Pp. 475, illustrated with eight chromolithographs and thirty-six engravings. (*New York: Cassell & Co., Limited, 1900.*)

In the twenty-two chapters of this volume are contained in concise form the essential facts with regard to the anatomy of the tongue, all of its usual and unusual diseases and the various methods of treatment, operative and otherwise, which have been undertaken for these affections. The first chapters are devoted to the anatomy of the tongue, congenital defects and inflammatory and other benign affections of the tongue. In discussing the appearances of the tongue under various conditions and the method of their production, Butlin expresses his belief that the results of every-day observations are still extremely indefinite, in spite of the fact that from the earliest times onward attempts have been made to collate the signs exhibited by the tongue with particular diseases as distinguished from constitutional states and to make the tongue serve as an aid in the diagnosis of disease. The tongue is in no way a trustworthy mirror of alterations in the mucous membrane of the intestinal tract. Tuberculosis and syphilis of the tongue and the rarer forms of diseases are thoroughly discussed and will be consulted by all who are specially interested in these subjects. For the general surgeon the chapters dealing with carcinomata will be of greatest interest. Butlin is not disposed to place much importance on predisposing causes of cancer such as syphilis, gout and hereditary tendencies, but exciting causes, particularly irritation by rough and carious teeth, ill-fitting tooth plates and frequent smoking with the rubbing of the stem of the pipe upon the surface of the tongue are thought to have much to do with the causation of carcinoma. Especial stress is laid upon the application of caustics: "If there be one thing more harmful than another in the treatment of simple and indolent sores and affections of the tongue in persons over thirty years of age it is the application of a strong caustic." The diseases most likely to be mistaken for carcinoma in making a diagnosis are syphilitic lumps and sores, tuberculous ulcers, simple warty tumors and simple ulcers and fissures. The resemblance which each one of these diseases at times bears to carcinoma is so great that the difficulty of deciding on the exact nature of the affection is extreme. The therapeutic test is of importance in syphilis, and in cases of doubt it is recommended that a portion of the ulcer should be cut out and examined microscopically. In operating for carcinoma the complete excision with removal of the glands of the neck is favored. The diseased area together with ¾ inch of apparently healthy tissue around it in every direction should be removed. As to the importance of removal of the lymphatic glands of the neck, Butlin states that out of 102 patients operated upon, no fewer than twenty-eight had recurrence in the lymphatic glands without recurrence of the disease *in situ*. The mortality for uncomplicated operations is estimated at scarcely 7 per cent, but it rises to more than 20 per cent for excisions below the jaw and to 25 per cent for operations which are complicated by removal of part of the lower jaw. The number of permanent cures is estimated from a study of statistics at about 20 per cent, but there is thought to be every reason to hope that this percentage, which is still very small, will be greatly improved in the future. At the same time it is probable that carcinoma of the tongue will always remain a very deadly disease. There is appended an extensive bibliography, classified under various headings, covering twenty-four pages.

This book is generally recognized as the most authoritative monograph which has appeared on this subject. It is indispensable for the library of the general surgeon and will prove an important addition, containing many valuable and interesting facts for the library of the general practitioner.

The Thirty-first Annual Report of the State Board of Health. (*Boston: Wright & Potter, 1900.*)

This report covers the operations of the Board for the year ending Sept. 30, 1899. Dr. H. P. Walcott and Dr. S. W. Abbott continued as president and secretary respectively, positions they have held for many years. There were no changes amongst the other members.

The General Report calls attention to the increased mortality in recent years throughout Massachusetts from local diseases (*i. e.*, of brain, heart, lungs, kidneys, etc.), but this increase is more than counterbalanced by the decrease in deaths from infectious diseases, so that the total death-rate shows a diminution; thus, with an average death-rate for fifty years of 19.5 deaths per 1000 living, the death-rate for 1899 was 17.4.

Smallpox.—There were 105 cases during 1899. From 1883 to 1899 there were 525 cases. Thus one-fifth the total number for these seventeen years occurred in the last year. Since 1885, the fatality (proportion of deaths to cases) was 26 per cent amongst the unvaccinated, 7.6 per cent amongst the vaccinated. Of those attacked by the disease, roughly one-half had been vaccinated; but about half of these had been vaccinated in infancy only. Further interesting details are given p. xvii.

Typhoid fever.—The death-rate continues to show a steady diminution.

Consumption.—The death-rate for the five-year periods from 1851-55 to 1891-95 shows a gradual and fairly steady decrease, from 41.1 per 10,000 living in the former period to 23.1 in the latter. In 1896 the rate was 21.7, dropping steadily to 18.7 in 1899.

Diphtheria.—From 1891 to 1895 the death-rate per 10,000 living fluctuated from 5.3 to 7.4, the fatality varying from 18.9 to 31.7. From 1896 to 1899 the death-rate fell to 2.6 in 1898, rising again to 3.7 in 1899. The fatality steadily diminished from 15.1 in 1896 to 11.5 in 1899.

Isolation hospitals.—This most important factor in the preventive control of infectious diseases is becoming prominent in Massachusetts, one-third of all the cities having provided themselves with hospitals for diphtheria and scarlet fever since 1890. Twice as many cities, however, have provision for smallpox patients, although smallpox is far less common. Not only are these hospitals valuable from a therapeutic standpoint, but the isolation of the patient in them is very much more efficient than it can be at home, and much trouble and expense to the family resulting from the rigid quarantine regulations in force when the patient remains at home are avoided. No question in public health is more pressing than the insuring of the maximum care for infectious patients at the minimum cost in time, trouble and cash to the family. The isolation hospital seems to be the one solution.

Increase of cancer.—The death-rate per 10,000 living in 1856 was males, 1.29; females, 2.45. In 1895, a practically unbroken record of increase ended with death-rates of 4.40 for males, 9.44

for females. While it is probable that greater accuracy in diagnosis accounts for part of this increase, the subject has been considered by the Board worthy of an investigation, which has been entrusted to a commission of physicians who are to report later.

Paris Exposition.—The secretary of the Board, Dr. S. W. Abbott, was invited by the Director of the Department of Social Economy, Education and Hygiene of the United States Commission to prepare a monograph on the progress of hygiene in the United States and to collect an exhibit of subjects pertaining to public health throughout the United States. This exhibition received a "Grand Prix." A gold medal was awarded to Dr. Abbott also in appreciation of his successful work in the matter.

Water supply and sewerage.—The work of the Board in these lines is best shown by a brief review of the main divisions. In 1899, seventy-nine official applications were made to the Board for advice on these subjects, this being the largest number in any year since the Board was established. After the necessary hearings, etc., appropriate action was taken. Chemical and microscopic examinations were made from 212 different sources of water supply, involving some 3500 analyses.

About 90 per cent of the population of this State live in districts having a public water supply. Only two towns with more than 3500 population are unprovided. Of the total population supplied, ten-elevenths receive their water from supplies publicly owned, the remaining one-eleventh from supplies owned by private companies.

By an unfortunate omission, the Acts of 1897, which authorize the State Board to make rules and regulations regarding pollution and to enforce the same, make no provision, in the absence of special legislative appropriations, for the payment of bills so incurred. Thus the action of the Board is unduly hampered.

Summer resorts.—One hundred and thirty or more exist throughout the State. The sanitary conditions of some of these were far from ideal. It has been a matter of remark in Boston for some years that the typhoid fever cases increase in number as soon as the tide of population turns cityward in the autumn, due in part at least to infection during the summer vacation. This factor is an unusually prominent one in Boston because the average wealth is high and with it corresponds the size of the summer exodus.

Under *Water Supply Statistics*, the table on p. 401 showing the water consumption of the various towns and cities, illustrates again the fact that the *per capita* consumption in districts of large population is greater, as a rule, than where the population is small.

Lawrence Experimental Station.—During 1898, many new investigations were begun under H. W. Clark on methods of purifying sewage at high rates of filtration. These were continued during 1899, with additional experiments based upon new points of practical interest developed during their study. The more important of the older intermittent sand filters have been continued in operation. The septic tank has received much attention. Bacterial or contact filters and the use of coarse filtering materials—broken stone, etc.—have been studied.

The treatment in the septic tank of sludge alone was suggested by the observation that the percentage of removal of organic matter increases with the strength of the entering sewage. In September, 1899, the investigation of this subject was begun. The supposed necessity of using a closed tank (to secure the exclusion of light and air) was shown a fallacy, since in the open tank air and light is excluded by the bacteria and fatty scum which form at the surface of the sewage. About two months were required for a septic tank to become fully active, the gas evolved measuring thereafter about 4½ per cent by bulk of the sewage treated. This gas is largely methane and nitrogen with small quantities of carbon dioxide, carbon monoxide,[1] oxygen and "heavy hydrocarbons." One value of the septic tank treatment, as a preliminary to filtration, lies in the destruction it ensures of the carbonaceous matters (cellulose, paper, etc.) to which the clogging of sewage filters is largely due in the absence of such treatment.

Some interesting work on the removal of *B. coli* from water by sand filters is given. The bacterial efficiency of a filter is generally supposed to be an index of the protection it affords in the removal of typhoid bacilli, should these exist in the applied water. The percentage of removal of *B. coli*—used in this instance as a substitute for the more difficult typhoid bacillus—does not, however, always correspond with the bacterial efficiency; thus, for certain months, the applied water at the city filter was examined both for total bacteria per cc. and for number of *B. coli* per cc. The effluent was also similarly examined. The results ran as follows:

1899.	Total bact. in applied water.	B. coli in applied water.	Total bact. in effluent water.	Bacterial efficiency.	% of times *B. coli* occurred in effluent.[2]	"*B. coli* efficiency."
Jan.	4900	28	83	98.31	54%	98.08
Feb.	5900	31	108	98.17	62%	98.00
Mar.	6300	19	45	99.30	8%	99.60

The last column of the above table was calculated by the present writer from the data given. The other figures are Mr. Clark's.

It would seem from the above that the efficiency of a filter for *B. coli* lessens more quickly as general bacterial efficiency drops than does this general efficiency itself, but still more striking is the other fact pointed out by Mr. Clark that, within the narrow play of 1.13 per cent variation in an efficiency never below 98.17, the variations in the *frequency* of presence in the effluent of *B. coli* (and by inference in the frequency of presence of typhoid bacilli were they present at all) are very marked.

Mr. Clark also contributes a paper on iron in ground waters. After discussing the various methods for its removal and illustrating each by experiments made on various Massachusetts' supplies, Mr. Clark concludes that different iron-bearing waters may require different methods of treatment for satisfactory purification.

Food and drug inspection.—The annual expense of the food and drug inspection increased from about $3000 in 1883 to over $11,000 in 1899. The number of samples examined, however, increased from about 1300 in 1883 to about 9800 in 1899, so that the expenditure per sample, as the report points out, decreased almost one-half.

The milk inspection was devoted mainly to the supervision of dairies, since the local milk inspectors of the various municipalities, while controlling the milk supply after it reaches those municipalities, have no jurisdiction over the sources of origin outside.

The number of prosecutions for adulteration diminished from 150 in 1891 to 47 in 1899 on account of (1st) the reduction of the legal standards of purity or strength; (2nd) the fact that inspectors whose business it is to collect samples gradually become known to the dealers, and it therefore becomes increasingly difficult for them to secure adulterated samples; (3d) the growth of local inspection; (4th) the efforts of the Board to go behind the often innocent retailers to reach the guilty producers, who in many cases reside outside of Massachusetts, which is a manufacturing and not a food-producing State; (5th) the actual improvement in the quality of foods placed on the market.

[1] Prof. L. P. Kinnicult states as the result of recent investigations that the gas recorded as carbon monoxide gives certain carbon monoxide reactions, but is not carbon monoxide. Its identity has not yet been determined.

[2] Each time *B. coli* was found, not more than one colony per cc. was probably present.

The report of the analyst, Albert E. Leach, is particularly valuable this year, since it gives the methods of analysis used. There are comparatively few food and drug experts in this country, but the ways in which adulterations are detected should be of interest to all consumers as well as to those scientifically inclined. It is true that the publication of the methods of analysis may afford to keen-witted, would-be adulterators suggestions for new ways of "beating the game," but it is the business of the expert to so conduct his investigations that he *cannot* be deceived. However keen the adulterators may be, the expert has the greater weight of scientific knowledge and experience behind him. Moreover, "thrice is he armed who hath his quarrel just."

Experiments on the solvent action of fruit acids on tin, bearing upon possible poisoning from canned goods, showed that most of the solution occurs in the first three months. The percentages of tin taken up by different strengths of different acids were determined.

An ingenious device for the deception of the public is that practiced by a certain baking powder concern, which advertises "All grocers are authorized to guarantee bread, etc.," made with this powder free from alum, ammonia, etc. It is to be noted that no claim is made that the *powder* is free from these substances; indeed, as a matter of fact, it contains both alum and ammonia, but the advertisement is true to the extent that in the preparation of bread, etc., the alum is converted into aluminum hydrate and the ammonia is driven off!

In the collecting of samples of drugs, lists of the articles wanted were furnished to various druggists. In some cases they interpreted these lists as prescriptions, so that the analyst received rather startling mixtures of such incompatibles as hydrobromic acid, silver nitrate and bicarbonate of soda!

Pathological and Bacteriological Laboratory.—Since 1895, Dr. Theobald Smith has manufactured from 65 million to 75 million units of diphtheria antitoxin. The strength of this antitoxin has varied from 200 to 400 units per cc. The amounts used per case are shown in a table on p. 657, reaching over 100,000 units for one patient in one instance. The total fatality of cases treated for five years is 11.2 per cent.

A summary of the diagnostic work of the Board follows and the volume ends with *Statistical Summaries* and condensed reports from the different cities and towns of the State.

Amongst the latter are some interesting accounts of *typhoid epidemics* traced to their sources, so far as was possible, by Dr. F. L. Morse, Medical Inspector of the Board. (See pages 737, 744, 754, etc.) In one of the epidemics described (p. 761) the infection was very clearly shown to be carried by celery which had been manured with undisinfected typhoid feces.

The impossibility of reaching an absolute decision as to the source of infection in the majority of typhoid epidemics is well illustrated by some of these accounts and should impress every one with the importance of reporting every epidemic in which the source may be indubitable, that the bulwarks of our faith in these matters may be duly strengthened from time to time. Too often it happens that the expert is called in so long after the source of infection has disappeared that only very tangled threads of evidence remain and the Scotch verdict of "not proven" must frequently be the sum total attained by prolonged and conscientious work. It is better to render such a verdict than one, which, while more definite in terms, is based upon evidence not wholly conclusive.

It is difficult to discriminate between the successive yearly reports of the Board, since all have been so excellent, but it is true that from a technical standpoint the present report will be of more interest to laboratory men than are those of the two or three preceding years. Particularly is this true of the reports, already briefly outlined, from Mr. Clark and Mr. Leach. The material of the latter's report recalls somewhat those earlier days when methods of analysis received treatment so instructive that the publications of the Board really formed technical text-books of a high order.

We must again regret the absence of other than a merely formal contribution from Dr. Theobald Smith. Indeed all the few faults of this report are those of omission, not of commission. Needless to say the typography is, as usual, above reproach.

HIBBERT WINSLOW HILL.

Practice of Medicine. A Text-book for Practitioners and Students, with Special Reference to Diagnosis and Treatment. By JAMES TYSON, M. D., Professor of Medicine in the University of Pennsylvania, and Physician to the Hospital of the University. Second edition, thoroughly revised and in parts rewritten. With 127 illustrations. (*Philadelphia: P. Blakiston's Son & Co., 1900.*)

The first edition of this admirable text-book appeared in 1896. It was most favorably reviewed in this journal in June, 1897. The second edition has been thoroughly revised and in part rewritten. This has been done with only a moderate increase in the number of pages of printed matter, the present edition containing 1222 pages. The revision has been largely made in the sections on infectious and nervous diseases. The section on Diseases of the Nervous System has been revised by Dr. William G. Spiller, which is sufficient guarantee for its having been thoroughly done and for the subject being brought up to date. We should like to have seen the subject of Neurasthenia dealt with more fully, however. Only three pages are devoted to it, which seems entirely insufficient considering the prevalence of the affection. There is probably no affection that the general practitioner appreciates or understands less, nor is there one, the treatment of which, gives him more annoyance and worry.

We occasionally observe that a recent clinical finding of importance in the symptomatology or diagnosis of a disease has escaped the notice of the author. For instance, we may call attention to the fact that no mention is made of the marked eosinophilia which is present in the acute stages of nearly all cases of trichinosis. This is one of the most valuable observations on the blood in any disease in recent years, and has been the feature that has attracted the attention of the observer to the possibility of an infection with trichinæ in so many of the recently reported cases.

In nearly every respect, however, the book is an admirable one. We know of no text-book on the practice of medicine that is more profusely illustrated by charts and plates. We predict for it the same success that attended the publication of the first edition.

Introduction to the Study of Medicine. By G. H. ROGER, Professor Extraordinary in the Faculty of Medicine of Paris. Authorized translation by M. S. GABRIEL, M. D. With additions by the author. (*New York: D. Appleton & Co., 1901.*)

This is in every way a most admirable book. It is based on a course of lectures delivered by Dr. Roger at the University of Paris during the session of 1897-98. The translator has done students and practitioners in this country a great service by the publication of this edition in English. The volume has been brought up to date by additions and corrections made by the author.

The work, which contains 545 pages, is in no sense intended to take the place of a text-book on the practice of medicine. The various diseases are not treated in detail, but the object has been to give the student who is just entering the practical stage of the study of medicine a thorough and broad understanding of the general principles which underlie disease. The object of the author will be appreciated best by quoting the following lines

from his preface: "We all know from experience how much time is wasted by not knowing with what subject to begin, what books to read, and also by being compelled frequently to refer to a dictionary for an explanation of technical terms encountered. With the view of relieving beginners of much useless embarrassment, the Faculty of Medicine intrusted me with the course of lectures which I now publish."

The first seven chapters are devoted to a description of how an individual becomes sick. The causes are considered under the heading of mechanical, physical and animate agents. Under the latter he takes up the general bacteriology of disease. He then proceeds to show how infection of the human organism takes place.

The sections devoted to disturbances of nutrition, heredity and inflammation are of unusual interest. We know of no text-book in which the important problems connected with heredity are presented so thoroughly and in so interesting a manner.

The author emphasizes the importance of careful observation of the case under treatment, and the proper interpretation of the conditions and physical signs found. The chapters on semeiology are of great value to the student in teaching him the proper method of observing and examining a patient. The book concludes with chapters dealing with the general considerations which should guide one in making a diagnosis or prognosis of a case and in outlining its treatment.

This book will be found of great service not only to the beginner, but also to the advanced student in medicine, as well as to practitioners. We know of no book of its kind in English. It is filled with practical points which are not found in the ordinary text-books of medicine. The book makes interesting reading and the translator has apparently done justice to the original edition.

Medical and Surgical Reports of the Boston City Hospital. Eleventh Series. Edited by HERBERT L. BURRELL, M. D.; W. T. COUNCILMAN, M. D., and CHARLES F. WITHINGTON, M. D. (*Boston: Published by the Trustees, 1900.*)

The volume of the Reports of the Boston City Hospital for 1900 contains twenty separate papers on medical and surgical subjects, with a total of 254 pages. A special appropriation has enabled the editors to illustrate the reports this year. There are several papers of especial interest, only a few of which can be referred to in this review.

Lund reports six cases of acute hæmorrhagic pancreatitis from the standpoint of the surgical treatment. Five of the cases were in women, and four of these also had gall-stones. In no case was a definite diagnosis made. Five of the cases were operated on, with one recovery.

Jackson gives an analysis of 59 cases of malignant endocarditis. In 43 cases the diagnosis was confirmed at autopsy. Cultures were made in 23 cases, organisms being obtained in pure culture in 19. The Streptococcus pyogenes was obtained in 8 cases, pneumococcus in 5, Staphylococcus aureus in 3, Colon bacillus in 1, Staphylococci and Streptococci in 1, Streptococcus and others in 1. The distribution of the lesion in the 43 cases was as follows: Aortic valves, 9 cases; aortic and mitral valves, 10 cases; mitral valve, 15 cases; right side of the heart, 6 cases; endocardium of ventricle, 3 cases.

Bottomley reports 28 cases of tuberculous peritonitis in which operative treatment had been adopted. Cases were considered recovered only when they returned well at least one year after the operation. Of the series, 11 recovered; the same number died. Two cases improved and 4 cases could not be traced.

Low gives the bacteriological findings in 100 cases of acute appendicitis. The results were as follows: Streptococcus pyogenes (pure culture), 2; Streptococcus pyogenes or diplococcus lanceolatus and Bacillus coli communis, 61; Streptococcus pyogenes and intestinal saprophytes, 15; Bacillus coli communis (pure culture), 8; Bacillus coli communis and unidentified cocci, 13; Bacillus lactis aërogenes and Bacillus pyocyaneus, 1.

Thomas and Hibbard have an interesting paper on Heart Failure in Diphtheria. They think that one death in five from diphtheria is due to heart failure. The complication is more frequent in children than in adults, and occurs most frequently in the second week of the disease.

Diseases of the Heart: Their Diagnosis and Treatment. By ALBERT ABRAMS, A. M., M. D., (Heidelberg), F. R. M. S. (*Chicago: G. P. Engelhard & Co., 1900.*)

This little volume of 170 pages contains a fund of information on cardiac diseases with a concise review of their symptomatology, physical signs and treatment. The subject is rather attractively presented. The author states that the book was never intended to aspire to the dignity of a treatise on diseases of the heart, but that the primary object was to make it useful to the practical physician in the diagnosis of cardiac diseases. The personal experience of the author is frequently met with throughout the volume. Whereas we can hardly see the need for such a compendium as this book is, it will no doubt be found of material aid to the general practitioner who has not the time to consult a more extensive treatise on the subject.

BOOKS RECEIVED.

Essentials of the Diseases of Children. Arranged in the Form of Questions and Answers. Prepared Especially for Students of Medicine. By William M. Powell, M. D. Third edition, thoroughly revised by Alfred Hand, Jr., A. B., M. D. (Saunders' Question-Compends, No. 15.) 1901. 12mo. 259 pages. W. B. Saunders & Company, Philadelphia and London.

Atlas and Epitome of Labor and Operative Obstetrics. By Dr. Oskar Schaeffer. Authorized translation from the fifth revised German edition. Edited by J. Clifton Edgar, A. M., M. D. With 14 Lithographic Plates in Colors and in 139 other Illustrations. (Saunders' Medical Hand-Atlases.) 1901. 12mo. 111 pages. W. B. Saunders & Company, Philadelphia and London.

Principles of Surgery. By N. Senn, M. D., Ph. D., LL. D. Third edition, thoroughly revised. With 230 Wood-engravings, Half-tones, and Colored Illustrations. 1901. 8vo. xv + 699 pages. F. A. Davis Company, Philadelphia and Chicago.

Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis. By Prof. Dr. O. Haab, of Zurich. Authorized translation from the third revised and enlarged German edition. Edited by G. E. de Schweinitz, A. M., M. D. With 152 Colored Lithographic Illustrations. (Saunders' Medical Hand-Atlases.) 1901. 12mo. 85 pages. W. B. Saunders & Company, Philadelphia and London.

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The Medical Department of the Johns Hopkins University was opened for the instruction of students October, 1893. This School of Medicine is an integral and coördinate part of the Johns Hopkins University, and it also derives great advantages from its close affiliation with the Johns Hopkins Hospital. The required period of study for the degree of Doctor of Medicine is four years. The academic year begins on the first of October and ends the middle of June, with short recesses at Christmas and Easter. Men and women are admitted upon the same terms.

In the methods of instruction especial emphasis is laid upon practical work in the Laboratories and in the Dispensary and Wards of the Hospital. While the aim of the School is primarily to train practitioners of medicine and surgery, it is recognized that the medical art should rest upon a suitable preliminary education and upon thorough training in the medical sciences. The first two years of the course are devoted mainly to practical work, combined with demonstrations, recitations and, when deemed necessary, lectures, in the Laboratories of Anatomy, Physiology, Physiological Chemistry, Pharmacology and Toxicology, Pathology and Bacteriology. During the last two years the student is given abundant opportunity for the personal study of cases of disease, his time being spent largely in the Hospital Wards and Dispensary and in the Clinical Laboratories. Especially advantageous for thorough clinical training are the arrangements by which the students, divided into groups, engage in practical work in the Dispensary, and throughout the fourth year serve as clinical clerks and surgical dressers in the wards of the Hospital.

REQUIREMENTS FOR ADMISSION.

As candidates for the degree of Doctor of Medicine the school receives:

1. Those who have satisfactorily completed the Chemical-Biological course which leads to the A. B. degree in this university.

2. Graduates of approved colleges or scientific schools who can furnish evidence: (a) That they have acquaintance with Latin and a good reading knowledge of French and German; (b) That they have such knowledge of physics, chemistry, and biology as is imparted by the regular minor courses given in these subjects in this university.

The phrase "a minor course," as here employed, means a course that requires a year for its completion. In physics, four class-room exercises and three hours a week in the laboratory are required; in chemistry and biology, four class-room exercises and five hours a week in the laboratory in each subject.

3. Those who give evidence by examination that they possess the general education implied by a degree in arts or in science from an approved college or scientific school, and the knowledge of French, German, Latin, physics, chemistry, and biology above indicated.

Applicants for admission will receive blanks to be filled out relating to their previous courses of study.

They are required to furnish certificates from officers of the college or scientific schools where they have studied, as to the courses pursued in physics, chemistry and biology. If such certificates are satisfactory, no examination in these subjects will be required from those who possess a degree in arts or science from an approved college or scientific school.

Candidates who have not received a degree in arts or in science from an approved college or scientific school will be required (1) to pass, at the beginning of the session in October, the matriculation examination for admission to the collegiate department of the Johns Hopkins University, (2) then to pass examinations equivalent to those taken by students completing the Chemical-Biological course which leads to the A. B. degree in this University, and (3) to furnish satisfactory certificates that they have had the requisite laboratory training as specified above. It is expected that only in very rare instances will applicants who do not possess a degree in arts or science be able to meet these requirements for admission.

Hearers and special workers, not candidates for a degree, will be received at the discretion of the Faculty.

ADMISSION TO ADVANCED STANDING.

Applicants for admission to advanced standing must furnish evidence (1) that the foregoing terms of admission as regards preliminary training have been fulfilled, (2) that courses equivalent in kind and amount to those given here, preceding that year of the course for admission to which application is made, have been satisfactorily completed, and (3) must pass examinations at the beginning of the session in October in all the subjects that have been already pursued by the class to which admission is sought. Certificates of standing elsewhere cannot be accepted in place of these examinations.

SPECIAL COURSES FOR GRADUATES IN MEDICINE.

Since the opening of the Johns Hopkins Hospital in 1889, courses of instruction have been offered to graduates in medicine. The attendance upon these courses has steadily increased with each succeeding year and indicates gratifying appreciation of the special advantages here afforded. With the completed organization of the Medical School, it was found necessary to give the courses intended especially for physicians at a later period of the academic year than that hitherto selected. It is, however, believed that the period now chosen for this purpose is more convenient for the majority of those desiring to take the courses than the former one. The special courses of instruction for graduates in medicine are now given annually during the months of May and June. During April there is a preliminary course in Normal Histology. These courses are in Pathology, Bacteriology, Clinical Microscopy, General Medicine, Surgery, Gynecology, Dermatology, Diseases of Children, Diseases of the Nervous System, Genito-Urinary Diseases, Laryngology and Rhinology, and Ophthalmology and Otology. The instruction is intended to meet the requirements of practitioners of medicine, and is almost wholly of a practical character. It includes laboratory courses, demonstrations, bedside teaching, and clinical instruction in the wards, dispensary, amphitheatre, and operating-rooms of the Hospital. These courses are open to those who have taken a medical degree and who give evidence satisfactory to the several instructors that they are prepared to profit by the opportunities here offered. The number of students who can be accommodated in some of the practical courses is necessarily limited. For these the places are assigned according to the date of application.

During October a select number of physicians will be admitted to a special class for the study of the important tropical diseases met with in this region.

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